Pyxis®

WALCHEM
IWAKI America Inc.

SP-800 Multi-Parameter Analyzer

Colorimeter + Turbidimeter

Pyxis Lab® Inc.
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PROCEDURES MANUAL

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HACH REQUIRED REAGENTS

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
AL	525	Aluminum Reagent	22420-00	AluVer 3 Aluminum Reagent Powder Pillow	14290-99
				Ascorbic Acid Powder Pillow	14577-99
				Bleaching 3 Reagent Powder Pillow	14294-49
AZOL	420	Triazole Reagent Powder Pillows	21412-99	N/A	N/A
Br-T	525	DPD Total Chlorine Reagent Powder Pillows	21056-69	N/A	N/A
Ca	525	Hardness Reagent Set	23199-00	Alkali Solution for Calcium and Magnesium Test	22417-32
				Calcium and Magnesium Indicator Solution	22418-32
				EDTA Solution, 1 M	22419-26
				EGTA Solution	22297-26
CODLR	420 630	CODLR Reagent	2038225	Low Range, 0 to 150 mg/L COD	N/A
CODHR	560 570 630	CODHR Reagent	2038325	High Range, 0 to 1,500 mg/L COD	N/A
CL2HR	420	DPD Total Chlorine Reagent Powder Pillows	14064-99	N/A	N/A

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
CL2HR	420	DPD Free Chlorine Reagent Powder Pillows	14070-99	N/A	N/A
CL-F	525	DPD Free Chlorine Powder Pillows	21055-69	N/A	N/A
CLO2	525	Chlorine Dioxide DPD/Glycine Reagent Set	27709-00	DPD Free Chlorine Reagent Powder Pillows	21055-69
				Glycine Reagent	27621-33
CLO2D	365	Direct Reading	N/A	N/A	N/A
CL-T	525	DPD Total Chlorine Reagent Powder Pillows	21056-69	N/A	N/A
CN	630	Cyanide Reagent Set	24302-00	CyaniVer 3 Cyanide Reagent Powder Pillows	21068-69
				CyaniVer 4 Cyanide Reagent Powder Pillows	21069-69
				CyaniVer 5 Cyanide Reagent Powder Pillows	21070-69
COLOR	420	Aspirator, vacuum	2131-00	N/A	N/A
		Filter Holder, 47 mm, 300 mL graduated	13529-00	N/A	N/A
		Filter, membrane, 47 mm, 0.45 microns	13530-00	N/A	N/A
		Flask, filtering, 500 mL	546-49	N/A	N/A
		Stopper, No. 7, one hole	2119-07	N/A	N/A

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
Cr6+	570	ChromaVer 3 Chromium Reagent Powder Pillows	12710-99	N/A	N/A
CrT	570	Total Chromium Reagent Set	22425-00	Acid Reagent Powder Pillows	2126-99
				ChromaVer 3 Chromium Reagent Powder Pillows	12066-99
				Chromium 1 Reagent Powder Pillows	2043-99
				Chromium 2 Reagent Powder Pillows	2044-99
CuBi	570	CuVer 1 Copper Reagent Powder Pillows	21058-69	N/A	N/A
CuL	420	Copper Reagent Set	26033-00	Copper Masking Reagent Powder Pillows	26034-49
				Porphyrin 1 Reagent Powder Pillows	26035-49
				Porphyrin 2 Reagent Powder Pillows	26036-49
CYAN	570	Cyanuric Acid 2 Reagent Powder Pillow	2460-66	N/A	N/A
DEHA	570	DEHA Reagent Set	24466-00	DEHA Reagent 1 Powder Pillow	21679-69
				DEHA Reagent 2 Powder Pillow	21680-42
F	570	SPADNS Reagent for Fluoride	444-49	N/A	N/A

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
FeMo	525	FerroMo Reagent Set	25448-00	FerroMo Iron Reagent 1 Powder Pillows	25437-68
				FerroMo Iron Reagent 2 Powder Pillows	25438-66
FePh	455	FerroVer Iron Reagent Powder Pillows	21057-69	N/A	N/A
FeTp	560	TPTZ Iron Reagent Powder Pillows	26087-99	N/A	N/A
FeZi	525	FerroZine Iron Reagent Solution Pillows	2301-66	N/A	N/A
CaMgL	630	ULR Hardness Reagent Set	26031-01	Chlorophosphonazo Solution	25895-49
				CDTA Solution	25896-36
Mg	525	Hardness Reagent Set	23199-00	Alkali Solution for Calcium and Magnesium Test	22417-32
				Calcium and Magnesium Indicator Solution	22418-32
				EDTA Solution, 1 M	22419-26
				EGTA Solution	22297-26
MnHR	525	High Range Manganese Reagent Set	24300-00	Buffer Powder Pillows, citrate type for Manganese	21076-69

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
MnLR	570	Manganese Reagent Set	26517-00	Alkaline-Cyanide Reagent	21223-26
				Ascorbic Acid Powder Pillows	14577-99
				PAN Indicator Solution, 0.1%	21224-26
MoHR	455	Molybdenum Reagent Set	26041-00	MolyVer 1 Reagent Powder Pillows	26042-99
				MolyVer 2 Reagent Powder Pillows	26043-99
				MolyVer 3 Reagent Powder Pillows	26044-99
MOLR	630	Molybdenum Reagent Set	24494-00	Molybdenum 1 Reagent for 20 mL sample size	23524-49
				Molybdenum 2 Reagent Solution	23525-12
N2H4	420	HydraVer 2 Hydrazine Reagent	1790-32	N/A	N/A
NH2C	630	Monochlor F Reagent Pillows	28022-46	N/A	N/A
N-TLR	455 420	Test ’N Tube Total Nitrogen Reagent Set	26722-45	TN Reagent C Vials, Acid Solution*	26721-45
				TN Hydroxide Reagent Sample Digestion Vials*	26717-45
				TN Persulfate Reagent Powder Pillows	26718-49
				TN Reagent A, Bisulfite Powder Pillows	26719-49
				TN Reagent B, Indicator Powder Pillows	26720-49

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
N-THR	455 420	Test ’N Tube HR Total Nitrogen Reagent Set	27141-00	HR Total Nitrogen Hydroxide Digestion Vials.	N/A
				Total Nitrogen Persulfate Reagent Powder Pillows	26718-46
				Total Nitrogen Reagent A, Bisulfite Powder Pillows	26719-46
				Total Nitrogen Reagent B, Indicator Powder Pillows	26720-46
				Total Nitrogen Reagent C Vials, Acid Solution	N/A
NH3S	630	Ammonia Nitrogen Reagent Set for 10-mL samples	26680-00	Ammonia Cyanurate Reagent Powder Pillows	26531-99
				Ammonia Salicylate Reagent Powder Pillows	26532-99
NH3LR	560 570 630	AmVer Reagent Set for Nitrogen, Ammonia, Low Range TNT	26045-45	AmVer Diluent Reagent, Low Range Test ‘N Tube	N/A
				Salicylate Reagent Powder Pillows, 5 mL sample	23952-66
				Cyanurate Reagent Powder Pillows, 5 mL sample	23954-66
NH3HR	560 570 630	AmVer™ Reagent Set for Nitrogen, Ammonia, High Rangee, TNT	26069-45	AmVer™ HR Reagent Test ‘N Tube™ Vials	N/A
				Ammonia Salicylate Reagent Powder Pillows	23952-66
				Ammonia Cyanurate Reagent Powder Pillows	23954-66

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
Ni	570	Nickel Reagent Set, 25 mL sample	22426-00	EDTA Reagent Powder Pillows	7005-99
				Phthalate-Phosphate Reagent Powder Pillows	21501-66
				P.A.N. Indicator Solution, 0.3%	21502-32
NO2D	365	Direct Reading	N/A	N/A	N/A
NO2HR	560	NitriVer 2 Nitrite Reagent Powder Pillows	21075-69	N/A	N/A
NO2LR	525	NitriVer 3 Nitrite Reagent Powder Pillows	21071-69	N/A	N/A
NO3HR	455	NitraVer 5 Nitrate Reagent Powder Pillows	21061-69	N/A	N/A
NO3MR	420	NitraVer 5 Nitrate Reagent Powder Pillows	21061-69	N/A	N/A
NO3CA	455 420	NitraVer X Nitrate, High Range Test 'N Tube Reagent Set	26053-45	Nitrate Pretreatment Solution Vials	N/A
				NitraVer X Reagent B Powder Pillows	26055-46
OPO4	630	PhosVer 3 Phosphate Reagent Powder Pillows	21060-69	N/A	N/A
Orgp	630	Phosphonates Reagent Set	24297-00	PhosVer 3 Phosphate Reagent Powder Pillows	21060-69
				Potassium Persulfate Pillow for Phosphonate	20847-69

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
Pami	630	High Range Reactive Phosphorus Reagent Set	22441-00	Amino Acid Reagent	1934-32
				Molybdate Reagent	2236-32
P-TLR	560 570 630	Total Phosphorus Test 'N Tube Reagent Set	27426-45	PhosVer 3 Phosphate Reagent Powder Pillows	21060-46
				Potassium Persulfate powder Pillows	20847-66
				Sodium Hydroxide Solution, 1.54 N	27430-42
				Test 'N Tube Acid Dilution Vials	N/A
P-THR	455 420	Total High Range Phosphorus Test 'N Tube™ Reagent Set	27672-45	Molybdovanadate Reagent	20760-26
				Potassium Persulfate Powder Pillows	20847-66
				Sodium Hydroxide Solution, 1.54 N	27430-42
				Total Phosphorus Test 'N Tube™ Vials	N/A
pH	560	Dropper, 0.5&1.0 mL marks	21247-20	N/A	N/A
		Phenol Red Indicator Solution, spec grade	26575-12	N/A	N/A
PMoV	455	Molybdovanadate Reagent	20760-32	N/A	N/A
S2-	630	Sulfide Reagent Set	22445-00	Sulfide 1 Reagent	1816-32
				Sulfide 2 Reagent	1817-32

Method	Wave length (nm)	Required Reagents	Cat. No.	Includes	Cat. No.
SiHR	455	High Range Silica Reagent Set	24296-00	Acid Reagent Powder Pillows for High Range Silica	21074-69
				Citric Acid Powder Pillows	21062-69
				Molybdate Reagent Powder Pillows for HR Silica	21073-69
SiLR	630	Low Range Silica Reagent Set	24593-00	Amino Acid F Reagent Powder Pillows	22540-69
				Citric Acid Powder Pillows	21062-69
				Molybdate 3 Reagent	1995-26
SO4	525	SulfaVer 4 Sulfate Reagent Powder Pillows	21067-69	N/A	N/A
TOC	560	Total Organic Carbon Direct Method Low Range Test 'N Tube Reagent Set	2760345	Acid Digestion Solution Vials, Low Range TOC (not sold separately)	N/A
				Buffer Solution, Sulfate (not sold separately; see alternate size below)	45233
				Funnel, micro, poly	2584335
				Indicator Ampule, Low Range TOC (not sold separately)	N/A
				TOC Persulfate Powder Pillows (not sold separately)	N/A
Zn	630	Zinc Reagent Set	24293-00	Cyclohexanone	14033-32
				ZincoVer 5 Reagent Powder Pillows	21066-69

PYXIS REQUIRED REAGENTS

IMPORTANT NOTE* Due to severe export regulatory restrictions, the following Pyxis specialty reagents are available for purchase in mainland China only.

Method	Wavelength (nm)	Required Reagents	PN	Includes	PN	Geographic Availability
ALKLR	570	ALK Reagent Set	31068	ALK-1	N/A	China Only
				ALK-2	N/A	China Only
ALKHR	630	ALK Reagent Set	31068	ALK-1	N/A	China Only
				ALK-2	N/A	China Only
CaHR	455 560	CaHR Reagent Set	31073	CaHR-1	N/A	China Only
				CaHR-2	N/A	China Only
CLLR	525	CLLR Reagent	31009	N/A	N/A	China Only
CLMR	630	CLMR Reagent	31004	N/A	N/A	China Only
CL2UH	525	CL2UH Reagent	31074	N/A	N/A	China Only
CLTMB	420	CLTMB Reagent	31075	N/A	N/A	China Only
CLO2H	455	Direct Reading	N/A	N/A	N/A	China Only
DO	455	DO Reagent	31119	DO-1	N/A	China Only
				DO-2	N/A	China Only
				DO-3	N/A	China Only
FeSal	420	FeSal Reagent	31078	N/A	N/A	China Only
H2O2	570	H2O2 Reagent	31079	N/A	N/A	Globally Available
H2O2L	455	H2O2L Reagent Set	31124	H2O2L-1	N/A	Globally Available
				H2O2L-2	N/A	Globally Available
NH3-F	365	Fluorescent Method Set	31091	NH3-F-1	N/A	China Only
				NH3-F-2	N/A	China Only
				NH3-F-3	N/A	China Only
O3	525	O3 Reagent	31118	N/A	N/A	Globally Available
PAA	525	PAA Reagent	31079	N/A	N/A	China Only
POLY	525	POLY Reagent Set	31092	POLY-1	N/A	China Only
				POLY-2	N/A	China Only
Sb3+	560	Sb3+ Reagent Set	31107	Sb3+ -1	N/A	China Only
				Sb3+ -2	N/A	China Only
				Sb3+ -3	N/A	China Only
				Sb3+ -4	N/A	China Only
Sb-T	560	Sb-T Reagent Set	31108	Sb-T -1	N/A	China Only
				Sb-T -2	N/A	China Only
				Sb-T -3	N/A	China Only
				Sb-T -4	N/A	China Only

Method	Wavelength (nm)	Required Reagents	PN	Includes	PN	
SO3LI	365	SO3LI Reagent Set	30604	SO3LI-1	N/A	China Only
				SO3LI-2	N/A	China Only
SO3LR	630	SO3LR Reagent Set	31089	SO3LR-1	N/A	China Only
				SO3LR-2	N/A	China Only
				SO3LR-3	N/A	China Only
SO3HR	630	SO3HR Reagent Set	31090	SO3HR-1	N/A	China Only
				SO3HR-2	N/A	China Only
				SO3HR-3	N/A	China Only
Urea	420	Urea Reagent Set	31081	Urea-1	N/A	China Only
				Urea-2	N/A	China Only
ZnXO	570	ZnXO Reagent Set	31052	ZnXO-1	N/A	China Only
				ZnXO-2	N/A	China Only

EXPRESSION FORM

Method	Expression Form		
AI	Al	Al2O3	—
ALKLR	CaCO3	—	—
ALKHR	CaCO3	—	—
AZOL	BENZO	TOLY	—
BLCH	Chlr	—	—
BLCHL	Chlr	—	—
Br-T	Br2	—	—
Ca	CaCO3	Ca	—
CaHR	CaCO3	Ca	—
CODLR/CODHR	COD	—	—
CLLR	CL	—	—
CLMR	CL	—	—
CL2HR	CL2	—	—
CL2HR	CL2	—	—
CL2UH	CL2	—	—
CL-F	CL2	—	—
CLTMB	CL2	—	—
CLO2	CLO2	—	—
CLO2D	CLO2	—	—

CLO2H	CLO2	—	—
CL-T	CL2	—	—
CN	CN	—	—
COLOR	Units	—	—
Cr6	Cr6	CrO4	—
CrT	Cr6	CrO4	—
CuBi	Cu	—	—
CuLR	Cu	—	—
CYAN	—	—	—
DO	O2	—	—
DEHA	DEHA	—	—
F	F	—	—
FeMo	Fe	—	—
FePh	Fe	—	—
FeSal	Fe	—	—
FeTp	Fe	—	—
FeZi	Fe	—	—
H2O2	H2O2	—	—
H2O2L	H2O2	—	—
Mg	CaCO3	Mg	—
MnHR	Mn	MnO4	—
Method	**Expression Form**		
MnLR	Mn	MnO4	—
MoHR	Mo6	MoO4	—
MoLR	Mo6	MoO4	—
N2H4	N2H4	—	—
NH2C	CL2	—	—
N-TLR	N	—	—
N-THR	N	—	—
NH3S	N	NH3	—
NH3LR	N	NH3	—
NH3HR	N	NH3	—
Ni	—	—	—
NO2D	NO2	N	NaNO2
NO2HR	NO2	N	NaNO2
NO2LR	NO2	N	NaNO2
NO3HR	N	NO3	NaNO3
NO3MR	N	NO3	NaNO3
NO3CA	N	—	—
PAA	PAA	—	—
OPO4	PO4	P	P2O5
Orgp	PO4	PBTC	HEDP
Pami	PO4	P	P2O5

P-TLR	PO4	P	P2O5
P-THR	PO4	P	P2O5
PH	pH	—	—
PMoV	PO4	P	P2O5
POLY	—	—	—
Sb3+	Sb	—	—
Sb-T	Sb	—	—
S2-	S2-	—	—
SiHR	SiO2	Si	—
SiLR	SiO2	Si	—
SO3LI	Sulfi	—	—
SO3LR	SO3	—	—
SO3HR	SO3	—	—
SO4	SO4	—	—
Urea	Urea	—	—
ZnXO	Zn	—	—
Zn	Zn	—	—

Note:

1. *Press the CONF key in the method result page to launch the method setup and calibration page.*
2. *Press the FORM key to select a concentration form from the list of forms that are available for this specific method*

SP-800 Reference APHA and EPA Methods

Item	Description	Reference Method
Turb	Turbidity	EPA 180.1 and ISO 7027
CODLR/ CODHR	Oxygen Demand, Chemical (Reactor Digestion 20 Minutes Method) – CODLR/CODHR	APHA 5220 D. Closed Reflux, Colorimetric Method EPA 410.4
CL2HR	Chlorine, Total, High Range - CL2HR	APHA 4500-CI G. DPD Colorimetric Method EPA 330.5
CL2HR	Chlorine, Free, High Range - CL2HR	APHA 4500-CI G. DPD Colorimetric Method EPA 330.5
CL2UH	Chlorine, Free, Ultra-High Range - CL2UH	APHA 4500-CI Blodometric Method I EPA 330.3
CL-F	Chlorine, Free - CL-F	APHA 4500-CI G. DPD Colorimetric Method EPA 330.5
CLO2	Chlorine Dioxide - CLO2	APHA 4500-CIO2 D. DPD Colorimetric Method
CL-T	Chlorine, Total - CL-T	APHA 4500-CI G. DPD Colorimetric Method EPA 330.5

COLOR	Color, True and Apparent - COLOR	APHA 2120-COLOR C Spectrophotometric Method EPA110.3
Cr6	Chromium, Hexavalent - Cr6	APHA 3500-Cr B Colorimetric Method EPA 7196A
CrT	Chromium, Total - CrT	APHA 3500-Cr B Colorimetric Method EPA 7196A
CN	Cyanide - CN	APHA 4500-CN E. Colorimetric Method EPA 335.3
F	Fluoride - F	APHA 4500-F- D SPADNS Method EPA 340.1
FePh	Total Iron - FePh	APHA 3500-Fe B Phenanthroline Method
MnHR	Manganese, High Range - MnHR	APHA 3500-Mn B Persulfate Method
N-TLR	Nitrogen, Total (Test 'N Tube Method) - N-TLR	APHA 4500-N C Persulfate Method
N-THR	Nitrogen, Total (Test 'N Tube Method) - N-THR	APHA 4500-N C Persulfate Method
NH3S	Nitrogen, Ammonia - NH3S	APHA 4500-NH3 F Phenate Method EPA 350.1
NH3LR	Nitrogen, Ammonia (Test 'N Tube) - NH3LR	APHA 4500-NH3 F Phenate Method EPA 350.1
NH3HR	Nitrogen, Ammonia (Test 'N Tube) - NH3HR	APHA 4500-NH3 F Phenate Method EPA 350.1
NO3HR	Nitrate, High Range - NO3HR	APHA 4500-NO3 E Cadmium Reduction Method EPA 353.3
Item	**Description**	**Reference Method**
NO3MR	Nitrate, Mid-Range - NO3MR	APHA 4500-NO3 E Cadmium Reduction Method EPA 353.3
OPO4	Phosphorus, Reactive - OPO4	APHA 4500-P E Ascorbic Acid Method EPA 365.2
PMoV	Phosphorus, Reactive - PMoV	APHA 4500-P C Vanadomolybdophosphoric Acid Method
S2-	Sulfide - S2-	APHA 4500-S2- D. Methylene Blue Method EPA 376.2
SiHR	Silica, High Range - SiHR	APHA 4500-SiO2 C Molybdosilicate Method
SiLR	Silica, Low Range - SiLR	APHA 4500-SiO2 D Heteropoly Blue Method EPA 370.1
SO4	Sulfate - SO4	APHA 4500-$SO4^{2-}$ E Turbidimetric Method EPA 375.4
Zn	Zinc - Zn	APHA 3500-Zn B. Zincin Method EPA 430.2
OrgP	Phosphonates - OrgP	APHA 4500-P I In-line UV/Persulfate Digestion and Flow Injection Analysis for Total Phosphorus (PROPOSED)EPA 365.3
P-TLR	Phosphorus, Total (Test 'N Tube Method) - P-TLR	APHA 4500-P I In-line UV/Persulfate Digestion and Flow Injection Analysis for

		Total Phosphorus (PROPOSED) EPA 365.3
P-THR	Phosphorus, Total (Test ‘N Tube Method) - P-THR	APHA 4500-P I In-line UV/Persulfate Digestion and Flow Injection Analysis for Total Phosphorus (PROPOSED)

1. Turbidity

Test Program

Description：SP-800 Turbidity Method (1.0 - 200.0 NTU)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups the main menu options.

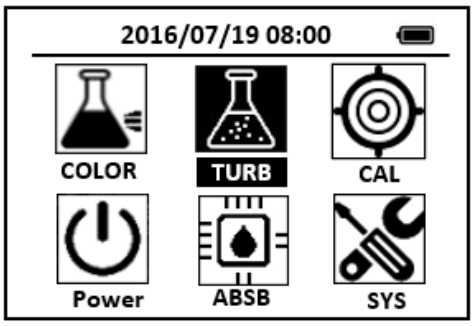

Figure 1

2. Move the cursor to **TURB** icon using the navigational (left, right, up, or down) keys.
3. Fill the 10 ml sample vial with the test solution and tightly cap the sample vial. Swirl the vial. Use a soft cloth or lint free paper tissue to clean the sample vial.
4. Place the sample vial into the sample vial compartment and slide the light shield cover to the closed position.
   Note: Mix the sample well before transferring it to the sample vial compartment.
5. Press the OK key in the main page. Pyxis SP-800 will start to measure the Turbidity concentration in the sample.
6. Pyxis SP-800 will display the Turbidity concentration in NTU as turbidity.

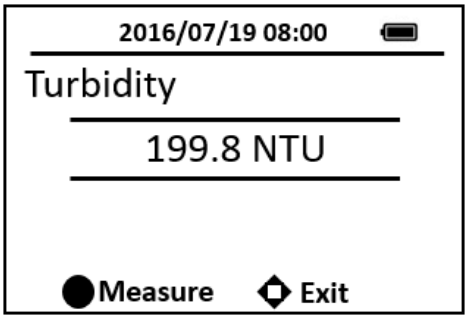

Figure 2

Notes:

1. *Collect samples in clean plastic or glass bottles. Analyze samples as soon as possible. Store samples up to 48 hours by cooling to 4°C (39 °F). Analyze the sample at the same temperature as it was collected.*
2. *If the sample contains air bubbles, tap the sample vial gently to remove the bubbles before placing the sample vial to sample vial compartment*.

Turbidity calibration

Deionized water (DI) as the blank calibration solution and the 50NTU /200NTU formazan calibration standard solution are needed.

1. Press **CAL** on the main page, then choose the turbidity and press the OK key to launch the turbidity calibration page.
2. Follow the message prompts, insert the DI blank into the sample vial compartment and press the OK key to measure the deionized water.

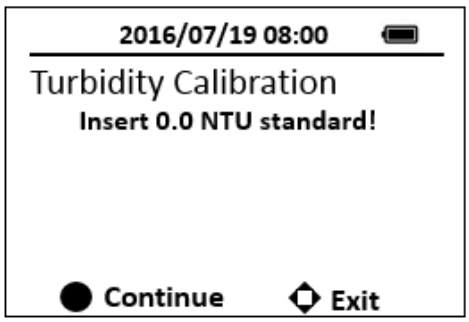

Figure 3

3. Follow the message prompts and insert the 50 NTU formazan standard into the sample vial compartment and press the OK key to measure the 50 NTU standard.

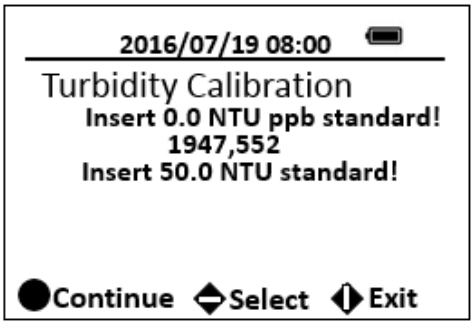

Figure 4

4. Press the OK key to continue high range turbidity calibration. If high range turbidity calibration not required, press any keys to exit.

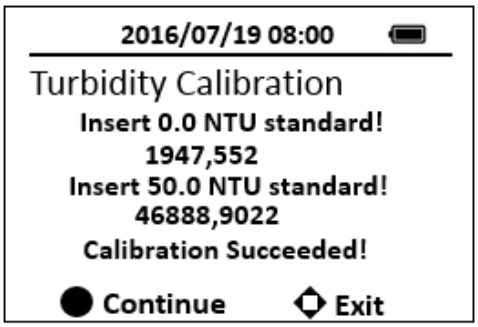

Figure 5

5. Fill the 10 ml sample vial to above 10 ml mark with the 200 NTU formazan standard. Insert the sample vial to the sample vial compartment.
6. Press the OK key to measure the 200 NTU standard. High range turbidity calibration is successful.

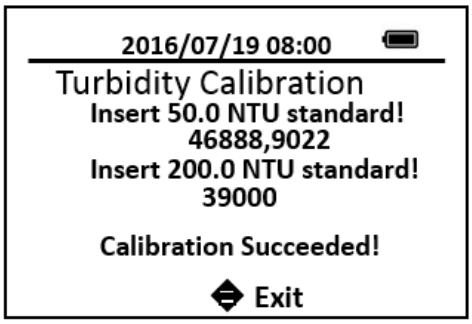

Figure 6

7. Press any keys to exit.
8. If calibration fails, the followings should be checked:
    - The DI blank is being contaminated.
    - The 50 NTU/200NTU formazan standard solution is decayed or being contaminated.
    - The light shield cover is not in the closing position.
    - The sample vial compartment is blocked with debris, water, or other materials.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

2. Aluminum – Al

Test Program

Description：SP-800 Aluminum Method (0.02 - 0.80 ppm Al) (Aluminon Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2 10-ml Sample Vial
3. 25-ml Sample Vial
4. 50-ml Graduated Mixing Cylinder
5. Hach Aluminum Reagent (Cat. No.22420-00)
   Includes:
   (1) AluVer 3 Aluminum Reagent Powder Pillow (Cat. No.14290-99)
   (2) Ascorbic Acid Powder Pillow (Cat. No.14577-99)
   (3) Bleaching 3 Reagent Powder Pillow (Cat. No.14294-49)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

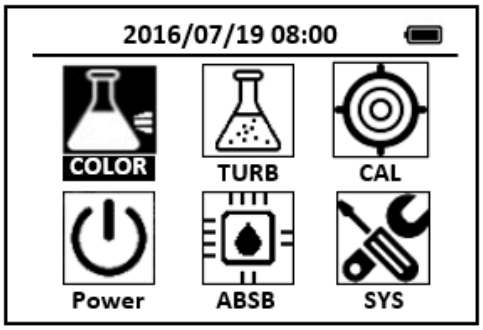

Figure 7

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Al** icon.

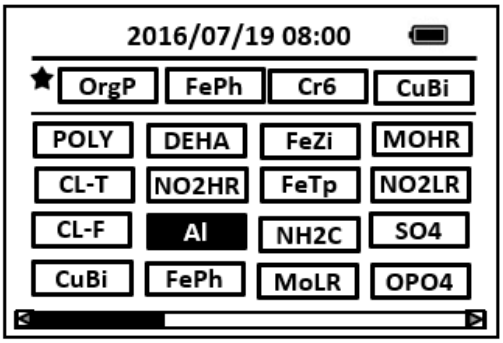

Figure 8

3. Press the OK key to enter **Al** test program interface.

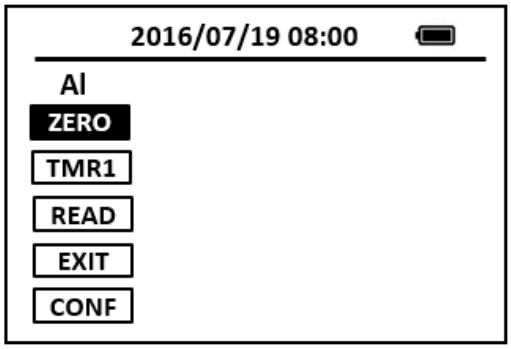

Figure 9

4. Fill a 50-ml graduated mixing cylinder to the 50-ml mark with sample.
   Note: Rinse cylinder with 1:1 Hydrochloric Acid and deionized water before use to avoid errors due to contaminants absorbed on the glass.
   Note: Sample temperature must be 20-25 °C (68-77 °F) for accurate results.
5. Add the contents of one Ascorbic Acid Powder Pillow to the graduated mixing cylinder. Swirl the vial to mix the reagent.
6. Add the contents of one AluVer® 3 Aluminum Reagent Powder Pillow to the graduated mixing cylinder. Swirl the vial to mix the reagent.

   Note: A red-orange color develops if aluminum is present.
   Note: Inconsistent results will occur if any powder is undissolved.
7. Press the **ZERO** key.
8. Press the **TMR1** Key to start the method timer, a 1-minute reaction period will begin. Invert the cylinder repeatedly for one minute.

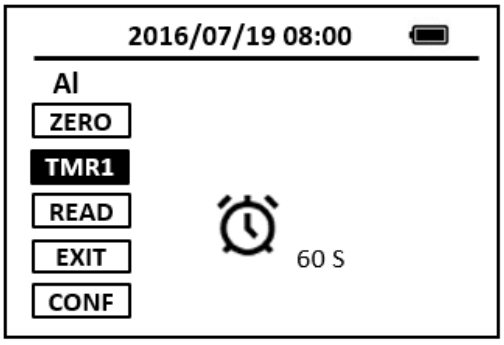

Figure 10

9. When the timer reaches the preset time and the reaction is complete, the timer beeps.
10. Pour 10 ml of mixture in the cylinder into a 10-ml sample vial (the prepared sample).
    Note: There is 40 ml remaining solution in the graduated mixing cylinder.
11. Pour 25 ml of mixture in the cylinder into a 25-ml sample vial.
12. Add the contents of one Bleaching 3 Reagent Powder Pillow to 25-ml sample vial. Stopper the cylinder.

Note: There is 15 ml remaining solution in the graduated mixing cylinder.

13. Press the **TMR2** key to start the method timer, a thirty-second reaction period will begin. vigorously shake the cylinder for the 30-second period.

Note: This solution should turn a light to medium orange upon bleaching. It will not become colorless.

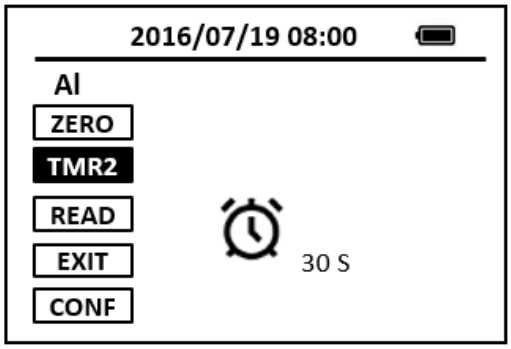

Figure 11

14. Press the **TMR3** Key to start the method timer, a 15-minute reaction period will begin.

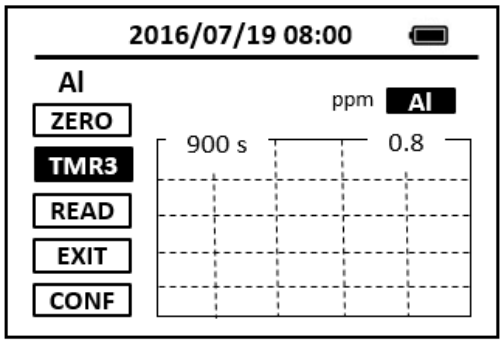

Figure 12

15. When the timer reaches the preset time and the reaction is complete, after the timer beeps, the cursor will automatically switch to **EXIT** Key. Press the OK Key to the icon menu-assisted.
16. Pour 10 ml of mixture in the 25-ml sample vial into a 10-ml sample vial (the blank sample).
17. Use a soft cloth or lint free paper tissue to clean the sample vial.
18. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** Key.
19. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ** Key.
20. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

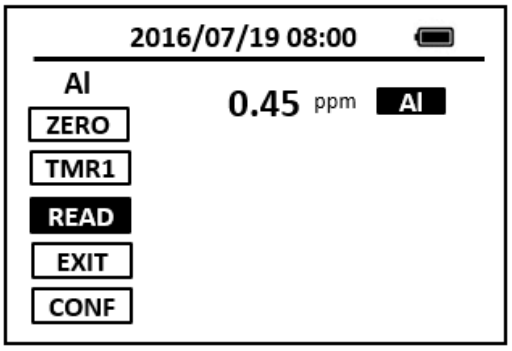

Figure 13

21. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8012

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

3. Alkalinity, Total, Low Range - ALKLR

Test Program

Description： SP-800 Alkalinity Total Low Range Method (5-100 ppm as CaCO3)

(Bromophenol Blue Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis ALK Reagent (PN: 31068)
   Includes:
   (1) ALK-1
   (2) ALK-2

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups

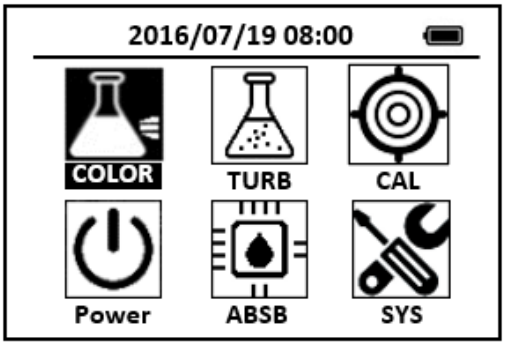

Figure 14

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **ALKLR** icon.

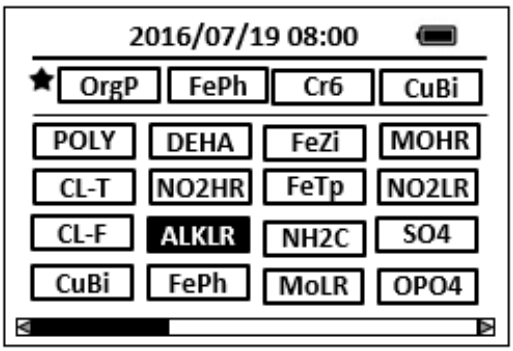

Figure 15

3. Press the OK key to enter **ALKLR** test program interface.

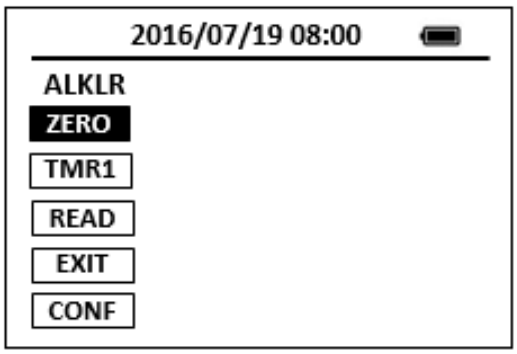

Figure 16

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill another sample vial to the 10-ml line with sample (the prepared sample).
6. Add 1 ml of ALK-1 reagent to each vial. Cap the vials and invert to mix.
7. Add 1 ml of ALK -2 reagent to each vial. Cap the vials and invert to mix.
8. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

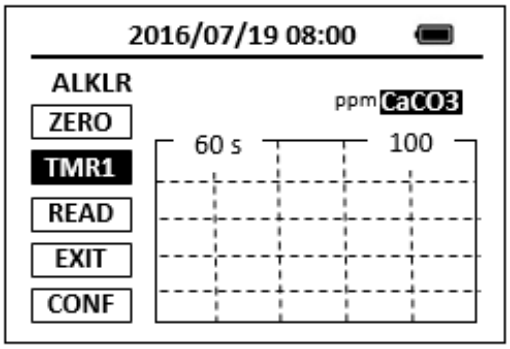

Figure 17

9. Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ** key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

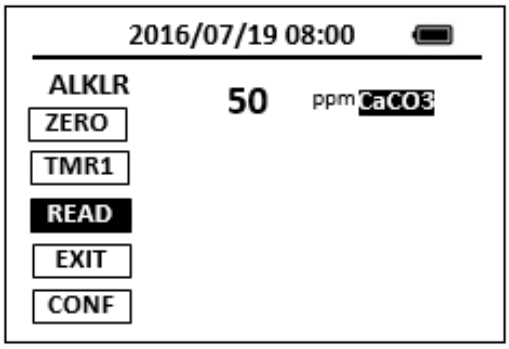

Figure 18

15. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

4. Alkalinity, Total, High Range - ALKHR

Test Program

Description：SP-800 Alkalinity Total High Range Method (100-500 ppm as CaCO3)

(Bromophenol Blue Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
4. Pyxis ALK Reagent (PN: 31068)
   Includes:
   (1) ALK-1
   (2) ALK-2

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

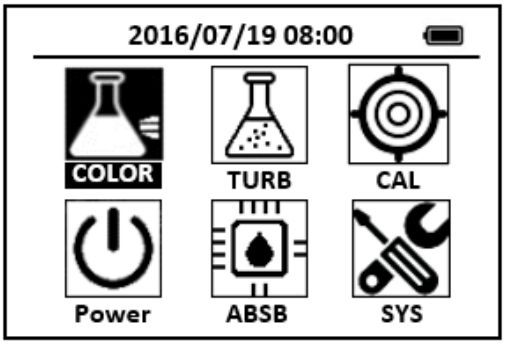

Figure 19

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **ALKHR** icon.

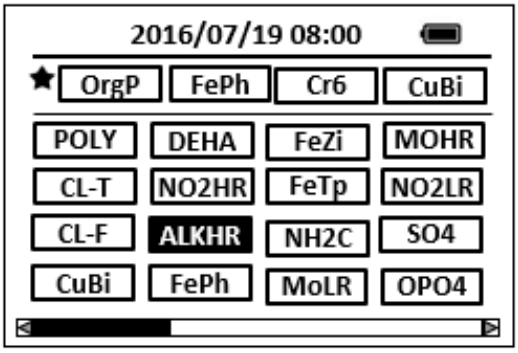

Figure 20

3. Press the OK key to enter **ALKHR** test program interface.

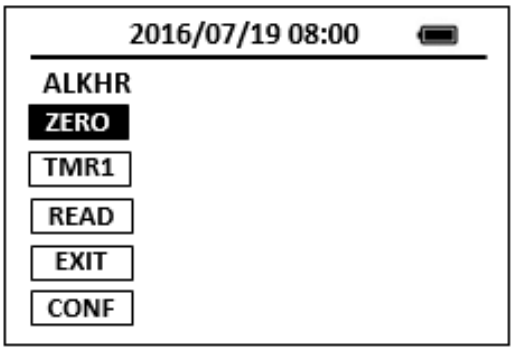

Figure 21

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill another sample vial to the 10-ml line with sample (the prepared sample).
6. Add 1 ml of ALK-1 reagent to each vial. Cap the vials and invert to mix.
7. Add 1 ml of ALK -2 reagent to each vial. Cap the vials and invert to mix.
8. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

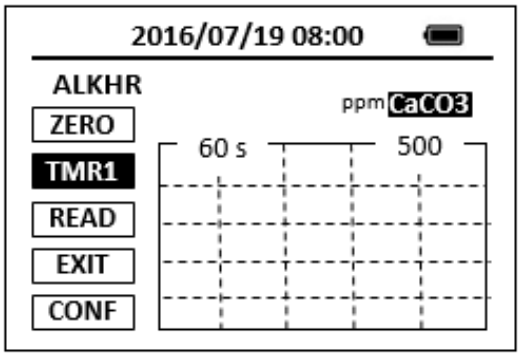

Figure 22

9. Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Move the cursor up to **ZERO**.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO**.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ**.
14. Concentration value based on the last absorbance value measured will be calculated and displayed.

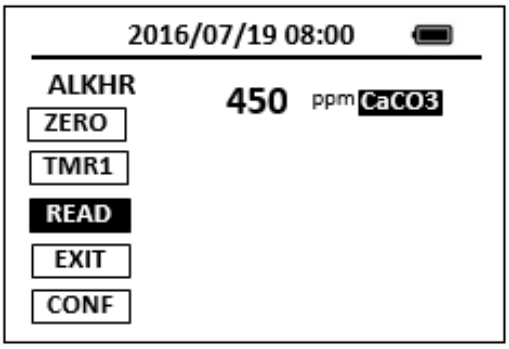

Figure 23

15. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

5. Benzotriazole/Tolyltriazole - AZOL

Test Program

Description：SP-800 AZOL Method (0.7-16.0 ppm BENZO or TOLY) (UV Photolysis Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Ultraviolet (UV) lamp, 115V, 60HZ
4. UV Safety Goggles
5. 25-ml Sample Vial
6. HACH Triazole Reagent Powder Pillows (Cat. No. 21412-99)

Program:

1. Fill a sample vial to the 25-ml mark with sample.
   Note: Sample temperature should be between 20-25 °C (68-77 °F).
   Note: If sample contains nitrite or borax (sodium borate), adjust the pH to between 4 and 6 with 1 N sulfuric acid.
2. Add the contents of one Triazole Reagent Powder Pillow to the 25-ml sample vial Swirl to dissolve completely.
   Note: If the sample contains more than 500 mg/L hardness (as CaCO3), add 10 drops of Rochelle Salt Solution.
3. Insert the ultraviolet (UV) lamp into the 25-ml sample vial.
   Note: Wear UV safety goggles while the lamp is on.
   Note: Do not handle the lamp surface. Fingerprints will etch the glass. Wipe lamp with a soft, clean tissue between samples.
   Note: A specially designed cord adapter is available for performing two digestions with a single power supply. A second UV lamp is required.
4. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

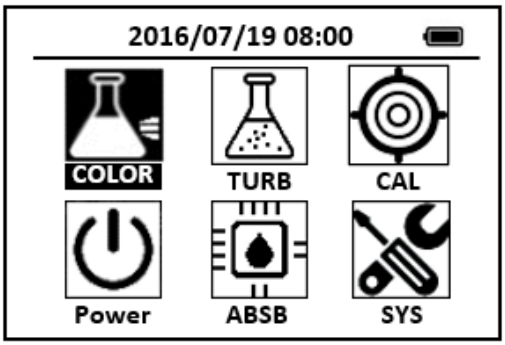

Figure 24

5. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **AZOL** icon.

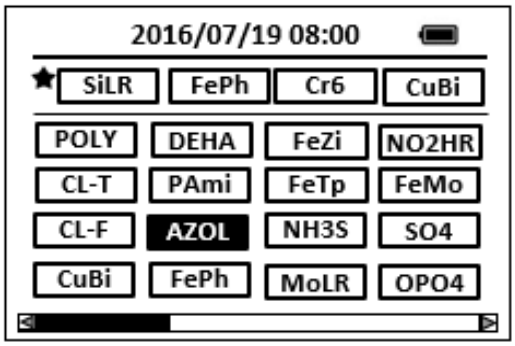

Figure 25

6. Press the OK key to enter **AZOL** test program interface.

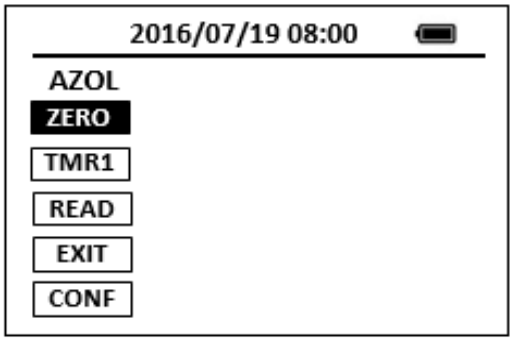

Figure 26

7. Press the **ZERO** key.

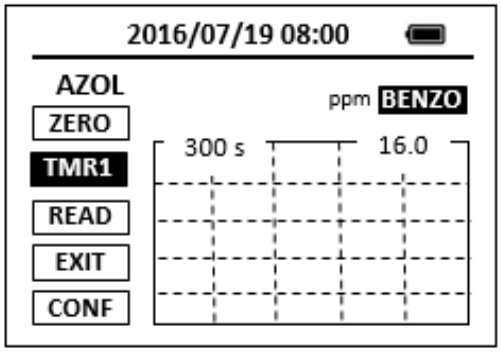

Figure 27

8. Turn on the UV lamp to digest the sample.
9. Press the **TMR1** Key to start the method timer, a 5-minute reaction period will begin.
   Note: A yellow color will form if triazole is present.
10. When the timer beeps, turn off the UV lamp. Remove it from the sample vial.
11. Pour 10 ml of sample from the 25-ml sample vial into a second sample vial.
    This is the prepared sample.
    Note: Low results will occur if photolysis (lamp ON) takes place for more or less than five minutes.

Note: Avoid handling the quartz surface of the lamp. Rinse the lamp and wipe with a soft, clean tissue between tests.

12. Fill a sample vial to the 10-ml mark with sample (the blank sample).
13. Use a soft cloth or lint free paper tissue to clean the sample vial.
14. Place the prepared blank into the sample vial compartment. Repeat step 5, and press **ZERO** Key.
15. Place the prepared sample into the sample vial compartment and press **READ** Key.
16. Concentration value based on the last absorbance value measured will be calculated and displayed.

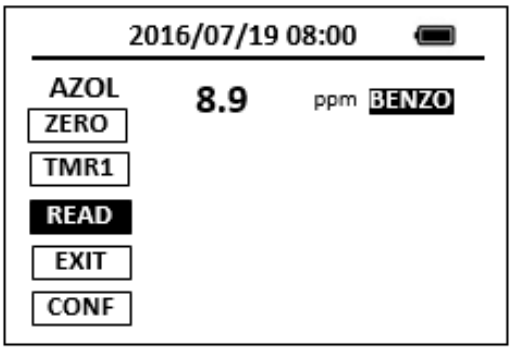

Figure 28

17. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8079

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

6. Bleach - BLCH

Test Program

Description：SP-800 Bleach Method (0.50-16.0 percent) (Direct Reading Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

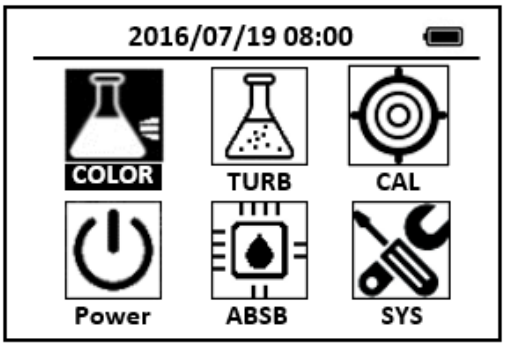

Figure 29

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **BLCH** icon.

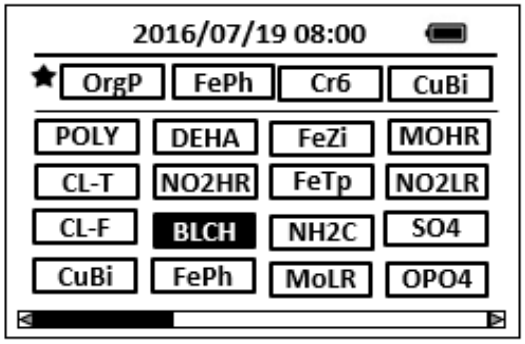

Figure 30

3. Press the OK key to enter the temperature input interface. Enter the temperature of the sample.

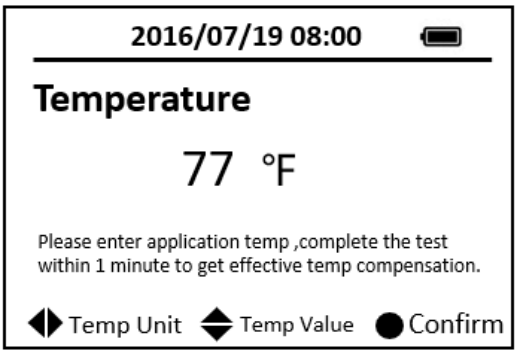

Figure 31

4. Press the OK key to enter **BLCH** test program interface.

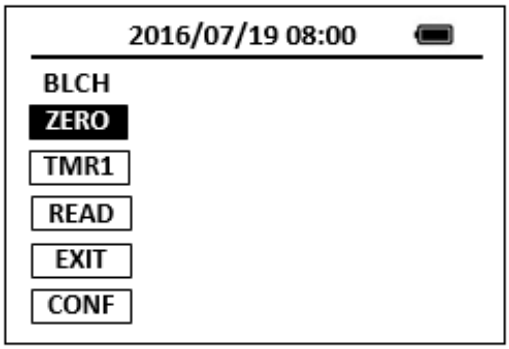

Figure 32

5. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
6. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

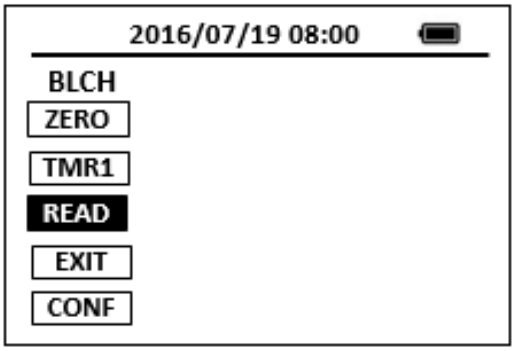

Figure 33

7. Fill a sample vial to the 10-ml line with sample (the prepared sample).
   Note: Analyze samples immediately after collection.
8. Use a soft cloth or lint free paper tissue to clean the sample vial.
9. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ** key.

10. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

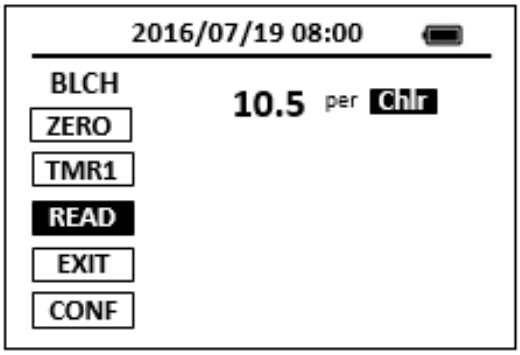

Figure 34

11. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument and return to the original page if it has any measurement data.*

7. Bleach - BLCHL

Test Program

Description：SP-800 Bleach Method (0.015-1.5percent) (Direct Reading Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. On the main page, the screen will display six major feature groups.

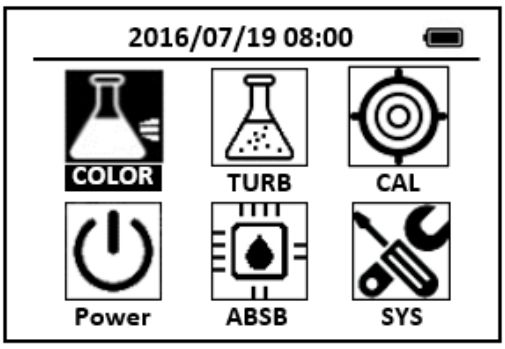

Figure 35

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **BLCHL** icon.

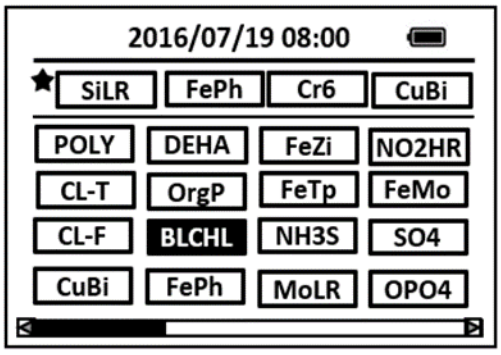

Figure 36

3. Press the OK key to enter the temperature input interface. Enter the temperature of the sample.

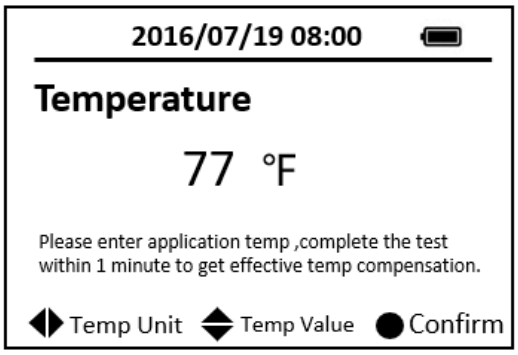

Figure 37

4. Press the OK key to enter **BLCHL** test program interface.

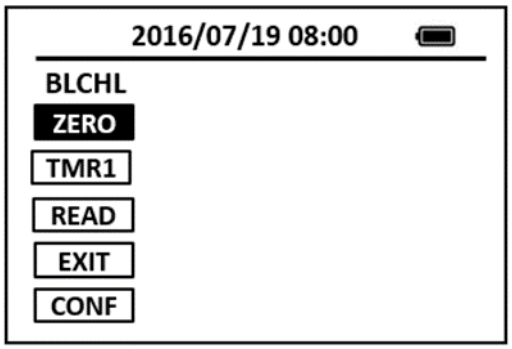

Figure 38

5. Fill a sample vial to the 10-ml line with deionized water (the blank sample). *Note: Analyze samples immediately after collection.*
6. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

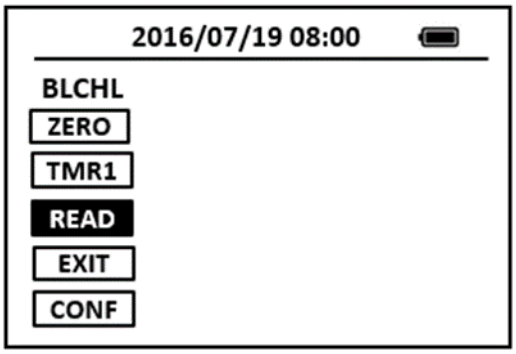

Figure 39

7. Fill a sample vial to the 10-ml line with sample (the prepared sample).
8. Use a soft cloth or lint free paper tissue to clean the sample vial.
9. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
10. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

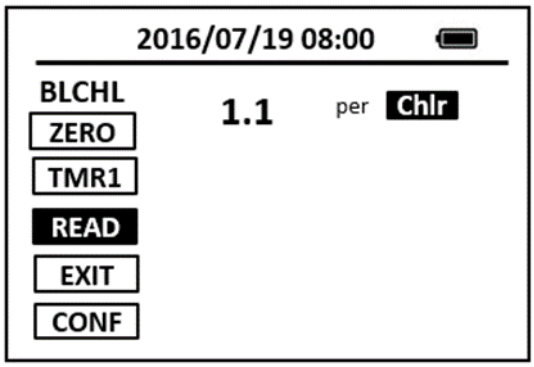

Figure 40

11. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

8. Bromine - Br-T

Test Program

Description：SP-800 Total Bromine Method (0.04-4.50 ppm Br2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH DPD Total Chlorine Reagent Powder Pillows (Cat. No. 21056-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

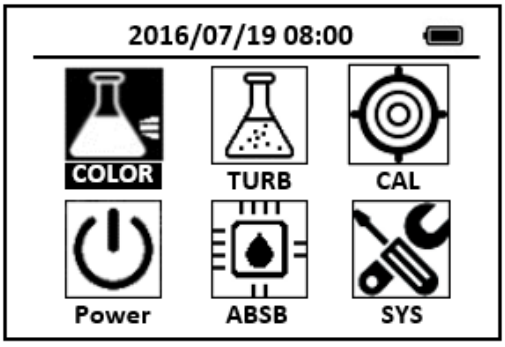

Figure 41

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Br-T** icon.

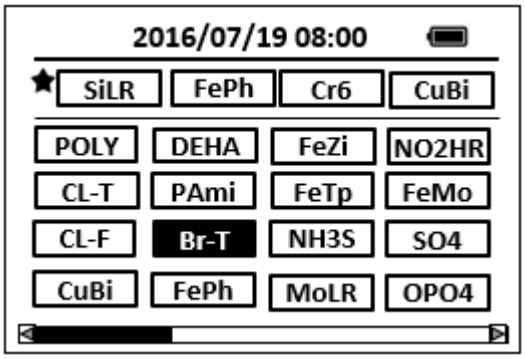

Figure 42

3. Press the OK key to enter **Br-T** test program interface.

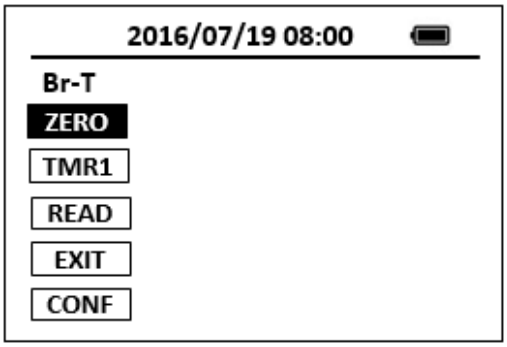

Figure 43

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** to zero the instrument. Pyxis SP-800 will display the page.

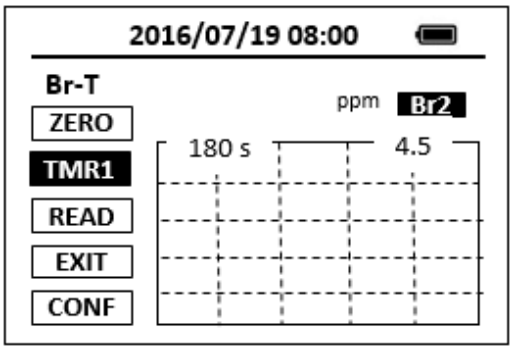

Figure 44

6. Take the sample vial out and add the contents of one DPD Total Chlorine Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: It is not necessary that all the powder dissolves. A pink color will develop if bromine is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

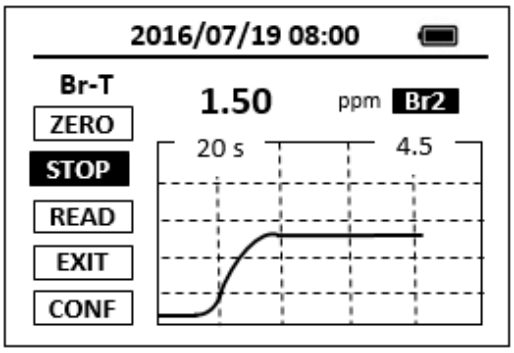

Figure 45

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8016

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument and return to the original page if it has any measurement data.*

9. Calcium - Ca

Test Program

Description：SP-800 Calcium Method (0.08-4.0 ppm Ca as CaCO3) (Calmagite Colorimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial (SP-800 accessory, 10 ml sample vial)
3. 100-ml graduated mixing cylinder
4. HACH Hardness Reagent Set (Cat. No. 23199-00)
   Includes:
   (1) Alkali Solution for Calcium and Magnesium Test (Cat. No. 22417-32)
   (2) Calcium and Magnesium Indicator Solution (Cat. No. 22418-32)
   (3) EDTA Solution (Cat. No. 22419-26)
   (4) EGTA (Cat. No. 22297-26)

Program:

1. Press OK Key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

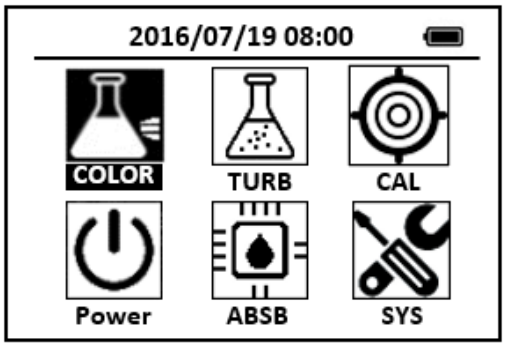

Figure 46

2. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **Ca** icon.

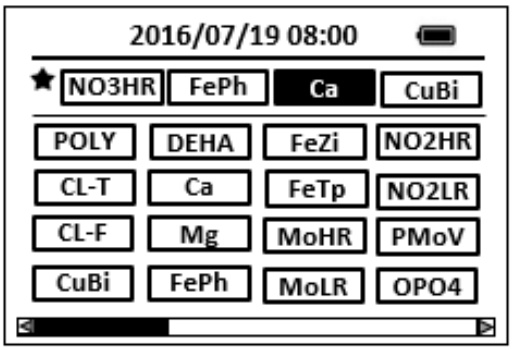

Figure 47

3. Press the OK Key to enter **Ca** test program interface.

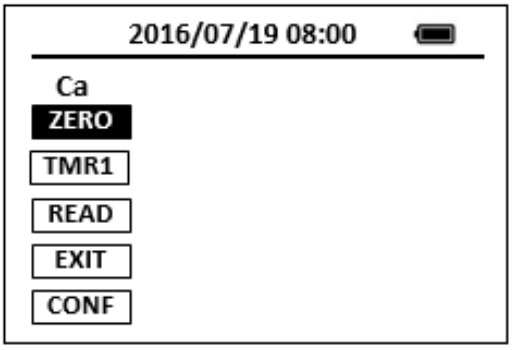

Figure 48

4. Pour 100 ml of sample into a 100-ml graduated mixing cylinder.
   Note: The sample temperature should be 21-29 °C (70-84 °F).
5. Add 1.0 ml of Calcium and Magnesium Indicator Solution using a 1.0-ml measuring dropper. Stopper. Swirl the vial to mix the reagent.
6. Add 1.0 ml of Alkali Solution for Calcium and Magnesium Test using a 1.0-ml measuring dropper. Stopper. Swirl the vial to mix the reagent.
   Note: If the sample turns read after adding Alkali Solution, dilute sample 1:1 and repeat analysis.
7. Pour 10 ml of the solution into each of two sample vials.
   Note: The test will detect any calcium or magnesium contamination in the mixing cylinder, measuring droppers or sample vials. To test cleanliness, repeat the test multiple times until you obtain consistent results.
8. Select one sample vial as prepared sample.
9. Add one drop of EGTA Solution to another vial (the blank sample). Stopper. Swirl the vial to mix the reagent.
10. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** Key to zero the instrument. Pyxis SP-800 will display the page.

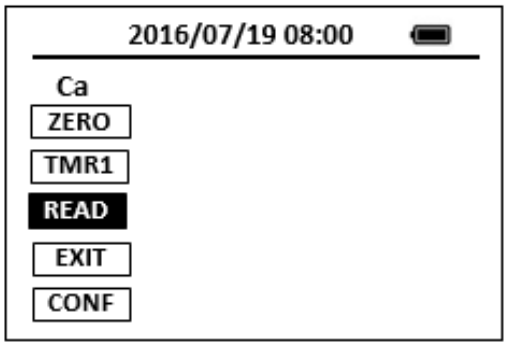

Figure 49

11. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ** Key.
12. A new concentration value based on the last absorbance value measured will be calculated and displayed.

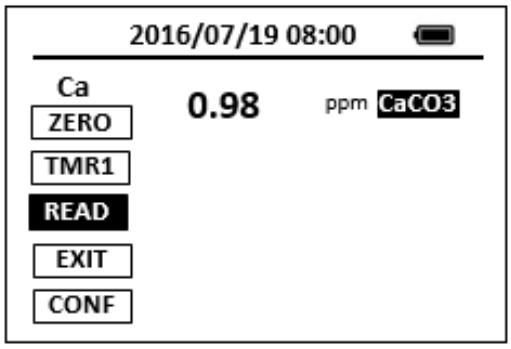

Figure 50

13. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8030

Notes:

1. *Rinse all glassware with 1:1 Hydrochloric Acid Solution. Rinse again with deionized water.*
2. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
3. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

10. Calcium Hardness - CaHR

Test Program

Description：SP-800 Calcium Hardness (25-500 ppm Ca as CaCO3) (Murexide Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis CaHR Reagent (PN: 31073)
   Includes:
   (1) CaHR-1
   (2) CaHR-2

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

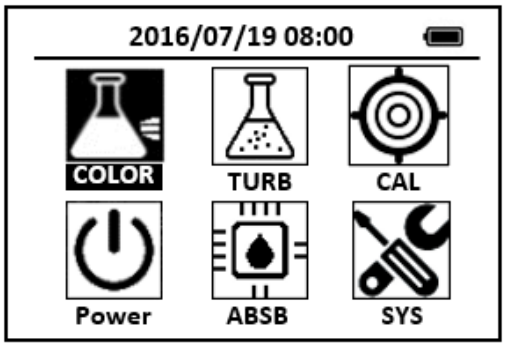

Figure 51

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CaHR** icon.

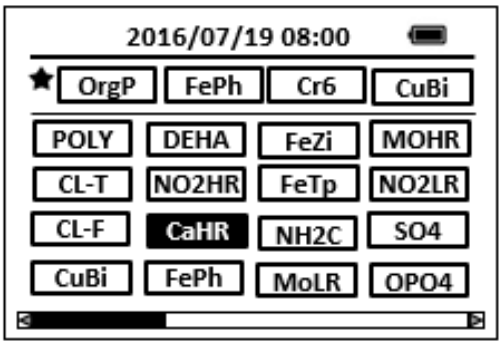

Figure 52

3. Press the OK key to enter **CaHR** test program interface.

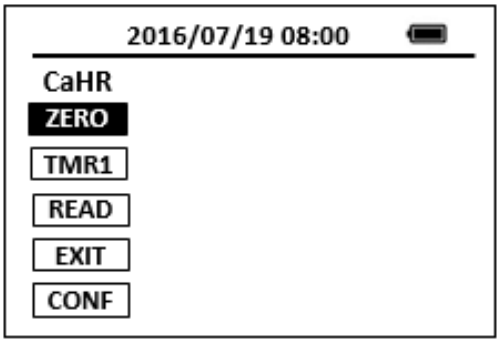

Figure 53

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill another sample vial to the 10-ml line with sample (the prepared sample).
6. Add the content of CaHR-1 reagent to each vial. Cap the vials and invert to mix.
7. Add the content of CaHR-2 reagent to each vial. Cap the vials and invert to mix.
8. Press **ZERO** key. Pyxis SP-800 will display the page.

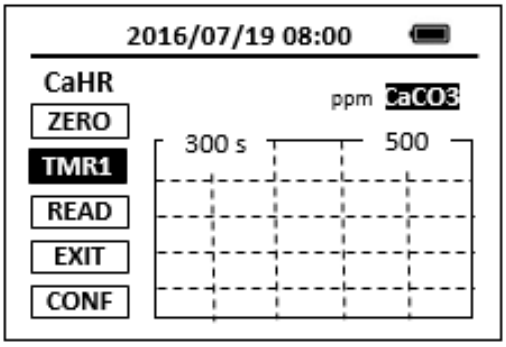

Figure 54

9. Press **TMR1** to start the method timer, a 5-minute reaction period will begin.

When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch **EXIT** key. Press the OK key to the icon menu-assisted.

10. Use a soft cloth or lint free paper tissue to clean the sample vial.
11. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press **ZERO** key.
12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press **READ** key.
13. Concentration value based on the last absorbance value measured will be calculated and displayed.

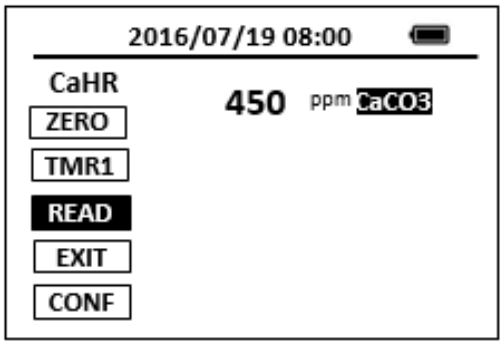

Figure 55

14. Press **EXIT** key to return to the main page.

Notes:

1. *Rinse all glassware with 1:1 Hydrochloric Acid Solution. Rinse again with deionized water.*
2. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
3. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

11. Hardness,Total,Ultra-Low Range - CaMgL

Test Program

Description： SP-800 Hardness, Total, Ultra-Low Range Method (0.008-1 ppm Ca & Mg as CaCO3)

(Chlorophosphonazo Colorimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Plastic Vial
4. ULR Hardness Reagent Set (Cat. No. 26031-01)
   Includes:
   (1) Chlorophosphonazo Indicator Solution Pillows (Cat. No. 25895-49)
   (2) CDTA Solution (Cat. No. 25896-36)

Program:

1. Press OK Key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. On the main page, the screen will display six major feature groups.

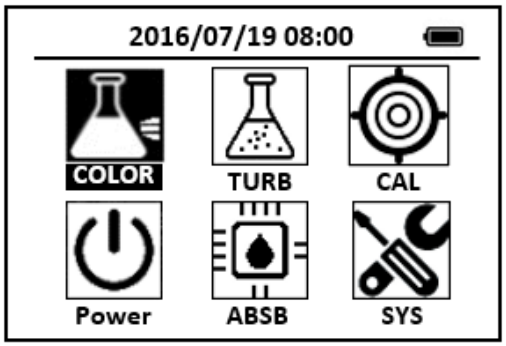

Figure 56

2. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **CaMgL** icon.

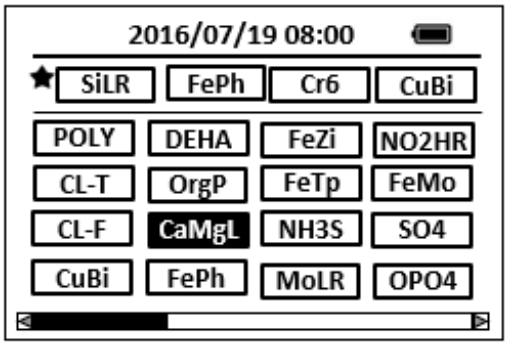

Figure 57

3. Press the OK key to enter **CaMgL** test program interface.

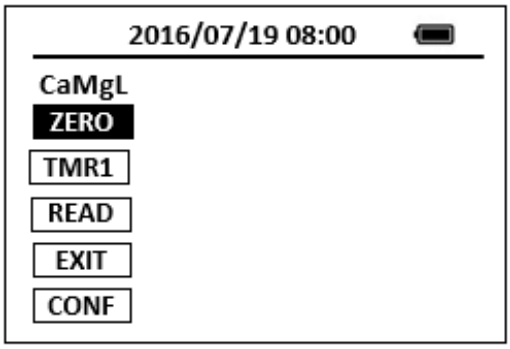

Figure 58

4. Rinse a plastic vial and the cap three times with the water to be tested. Do not allow the underside of the cap to come in contact with surfaces that may contaminate it.
   Note: Plastic vials must be used. Glass will contaminate the sample.
5. Fill a plastic vial to the 25-ml line with sample.
6. Add 1ml of Chlorophosphonazo Indicator Solution to the sample vial (the 25-ml blank sample). Cap the vial and invert to mix.
7. Fill another plastic vial to the 25-ml line with sample.
8. *Add 1ml of* Chlorophosphonazo Indicator Solution *to the sample vial*. Cap the vial and invert to mix. Add one drop of CDTA Solution *to the sample vial* (the 25-ml prepared sample). Cap the vial and invert to mix.
9. Measure 10 ml of *25*-ml blank sample into 10-ml sample vial as the blank sample.
10. Measure 10 ml of *25*-ml prepared sample into 10-ml sample vial as the prepared sample.
11. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

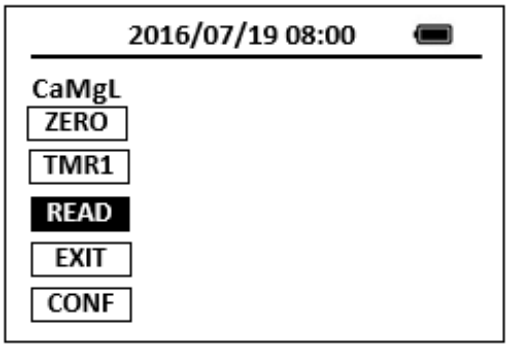

Figure 59

12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
    Note: Complete steps 12-13 within 1-2 minutes.
13. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

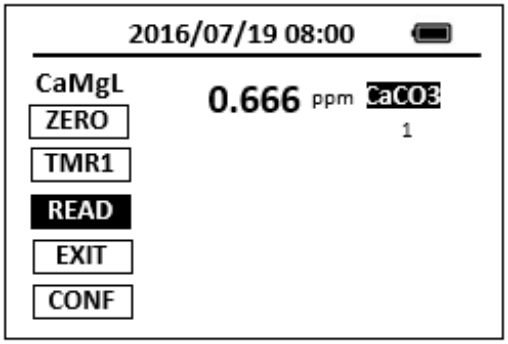

Figure 60

14. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8374

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 Hydrochloric Acid Solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*

4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

12. Oxygen Demand, Chemical (Reactor Digestion 20 Minutes Method) – CODLR/CODHR

Test Program

Description： SP-800 COD Method (15-150 ppm/100-1500 ppm COD) (Reactor Digestion 20 Minutes Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. Blender, 120 V, 14 speed/ Blender, 240 V, 14 speed
4. COD/TNT adapter
5. HACH CODLR/CODHR Reagent
   Select the appropriate COD Digestion Reagent Vial:
   - Low Range, 0 to 150 mg/L COD (Cat. No. 2038225)
   - High Range, 0 to 1,500 mg/L COD (Cat. No. 2038325)

Program:

1. Homogenize 500 ml of sample for 2 minutes in a blender.
   Note: Pour the blended sample into a 250-ml beaker. Stir with a magnetic stirrer while withdrawing a sample aliquot. This improves accuracy and reproducibility
2. Turn on the RD-800 Reactor. Preheat to 165 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
3. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

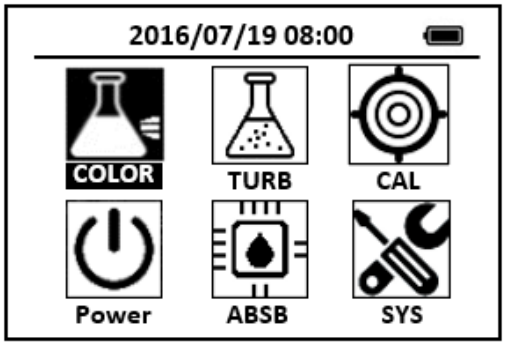

Figure 61

4. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter

COLOR selection interface, according to COD digestion reagent vial for the appropriate range, position the cursor to **CODLR** or **CODHR** icon.

Note: The reagent mixture is light-sensitive. Keep unused vials in the opaque shipping container, in a refrigerator if possible. The light striking the vials during the test will not affect results.

Table 1

Sample Conc. Range (mg/L)	COD Digestion Reagent Vial Type
15 –150	CODLR
100 -1500	CODHR

Note: Some of the chemicals and apparatus used in this procedure may be hazardous to the health and safety of the user if inappropriately or accidentally misused. Wear appropriate eye protection and clothing. If contact occurs, flush the affected area with running water.

5. Hold the vial at a 45-degree angle. Pipet 2.00 ml of sample into the vial

   Note: For greater accuracy analyze a minimum of three replicates and average the results.

   Note: Spilled reagent will affect test accuracy and is hazardous to skin and other materials. Do not run tests with vials which have been spilled. If spills occur, wash with running water
6. Replace the vial cap tightly. Rinse the outside of the COD vial with deionized water and wipe the vial clean with a paper towel.
7. Hold the vial by the cap and over a sink. Invert gently several times to mix the contents. Place the vial in the preheated RD-800 Reactor.

   Note: The vial will become very hot during mixing.
8. Prepare a blank by repeating Steps 4 to 7, substituting 2.00 ml deionized water for the sample.

   Note: Be sure the pipet is clean.

   Note: One blank must be run with each set of samples. Run samples and blanks with vials from the same lot number (lot # is on the container label)
9. Heat the vials for 20 minutes.
10. Turn the reactor off. Wait about 20 minutes for the vials to cool to 120 °C or less.
11. Invert each vial several times while still warm. Place the vials into a rack. Wait until the vials have cooled to room temperature.

    Note: If a pure green color appears in the reacted sample, measure the COD and, if necessary, repeat the test with a diluted sample.
12. Use one of the following analytical techniques to measure the COD:
    - Colorimetric method,15-150 mg/L COD
    - Colorimetric method,100-1,500 mg/L COD

Colorimetric Determination, 15 to 150 mg/L COD

1. Position the cursor to CODLR icon.

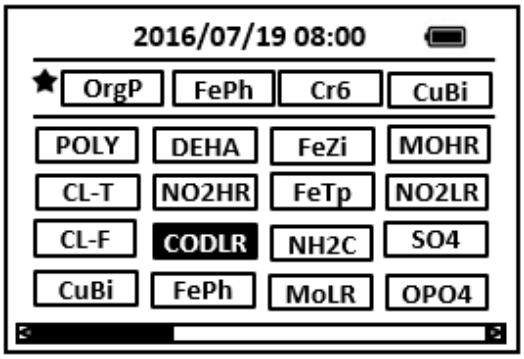

Figure 62

2. Press the OK key to enter CODLR test program interface.

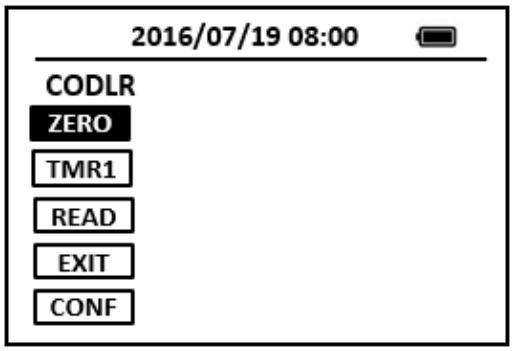

Figure 63

3. Insert the COD/TNT adapter into the vial holder. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band.
4. Clean the outside of the blank with a towel.
   Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks.
5. Place the blank in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
6. Tightly cover the vial with the instrument cap.
   Note: The blank is stable when stored in the dark.
7. press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

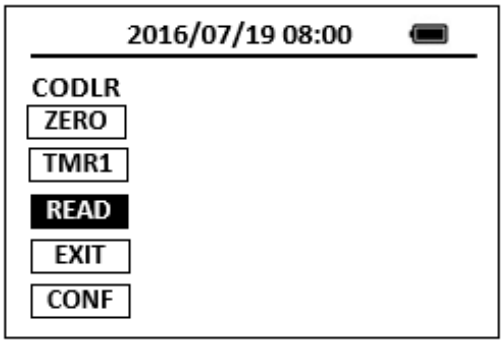

Figure 64

8. Clean the outside of the sample vial with a towel.
9. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
10. Tightly cover the vial with the instrument cap and press the **READ** key.
11. Concentration value based on the last absorbance value measured will be calculated and displayed.

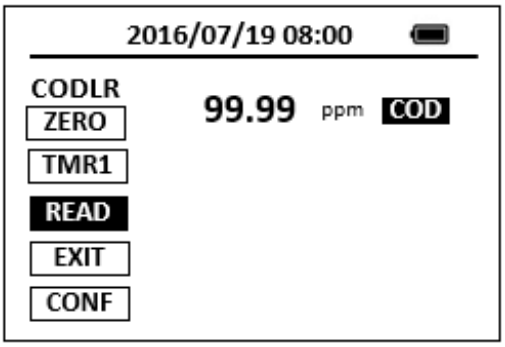

Figure 65

Colorimetric Determination, 100 to 1500 mg/L COD

1. Position the cursor to CODHR icon.

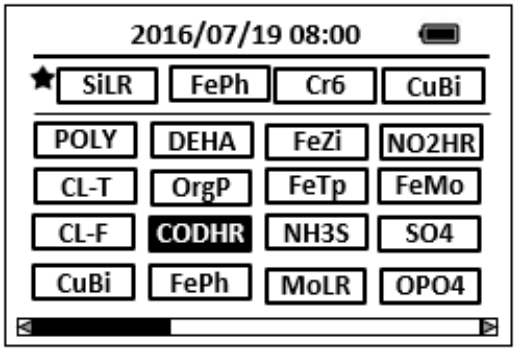

Figure 66

2. Press the OK key to enter CODHR test program interface.

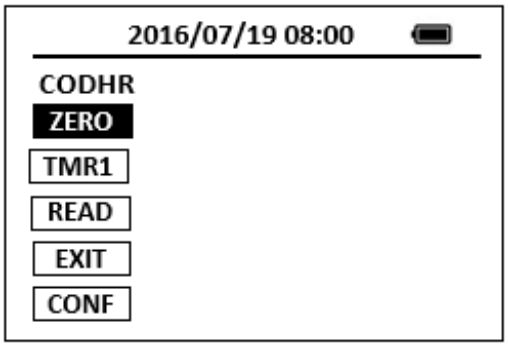

Figure 67

3. Insert the COD/TNT adapter into the vial holder. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band
4. Clean the outside of the blank with a towel.
   Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks.
5. Place the blank in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
6. Tightly cover the vial with the instrument cap.
   Note: The blank is stable when stored in the dark.
7. press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

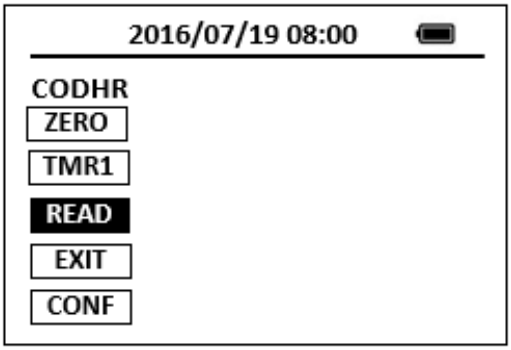

Figure 68

8. Clean the outside of the sample vial with a towel.
9. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
10. Tightly cover the vial with the instrument cap and press the **READ** key.
11. Concentration value based on the last absorbance value measured will be calculated and displayed.

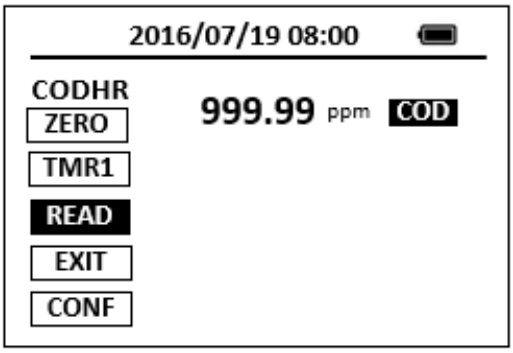

Figure 69

The method is compatible with HACH 10259

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

13. Chloride Low Range - CLLR

Test Program

Description： SP-800 Chloride Low Range Method (2.5-40.0 ppm CL) (Turbidimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis CLLR Reagent (PN: 31009)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

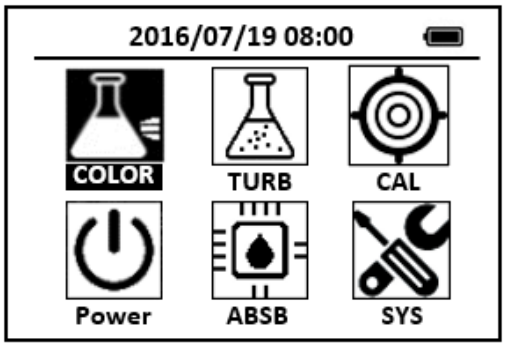

Figure 70

2. Position the cursor to COLOR icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLLR** icon.

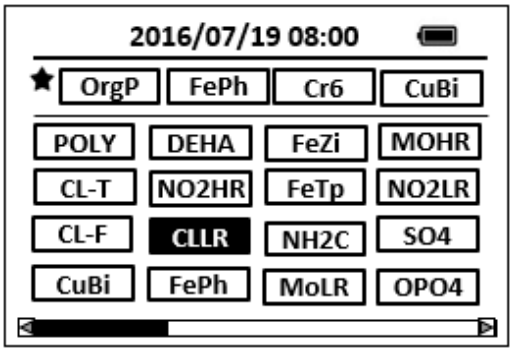

Figure 71

3. Press the OK key to enter **CLLR** test program interface.

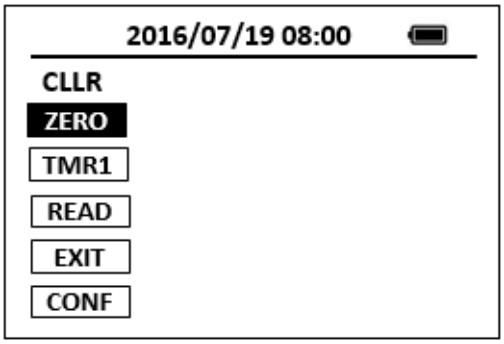

Figure 72

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

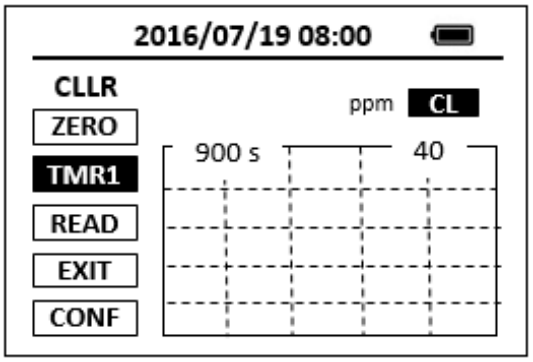

Figure 73

7. Take the sample vial out, add 2 ml of CLLR reagent to the sample vial, Cap the vials and invert the sample gently 20 times.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

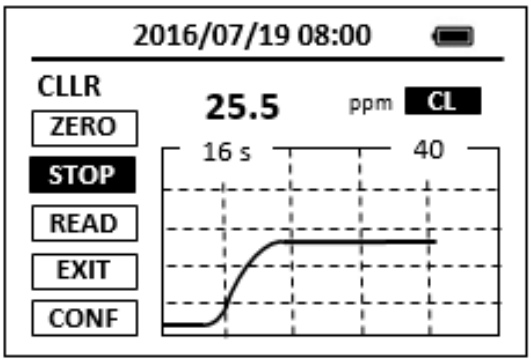

Figure 74

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

14. Chloride Medium Range - CLMR

Test Program

Description： SP-800 Chloride Medium Range Method (40-400 ppm CL) (Turbidimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis CLMR Reagent (PN: 31004)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

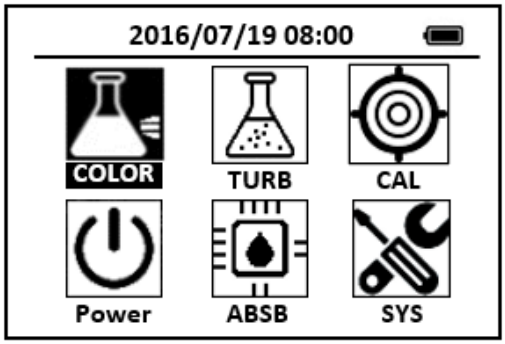

Figure 75

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLMR** icon.

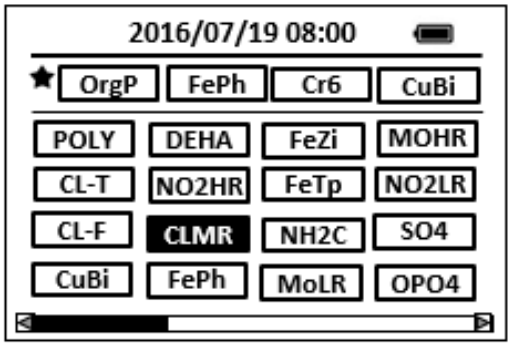

Figure 76

3. Press the OK key to enter **CLMR** test program interface.

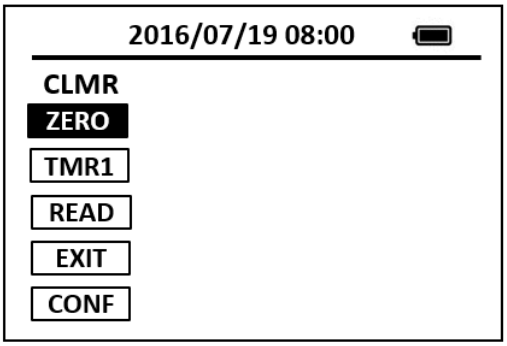

Figure 77

4. Fill a sample vial to the 10-ml line with CLMR reagent (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

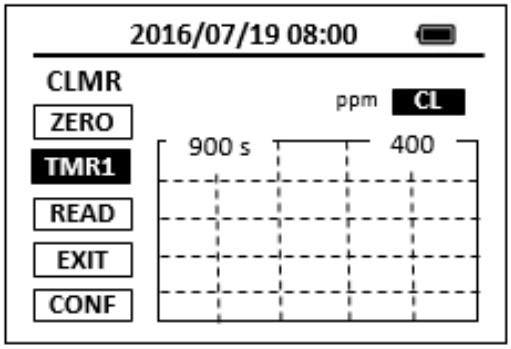

Figure 78

7. Take the sample vial out, add 1 ml of sample to the sample vial, Cap the vials and invert the sample gently 20 times.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

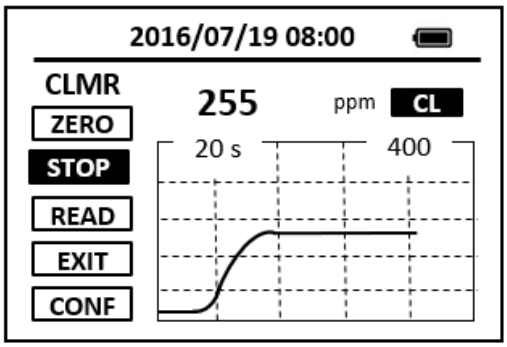

Figure 79

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

15. Chlorine, Total, High Range - CL2HR

Test Program

Description：SP-800 Total Chlorine High Range Method (0.1-10 ppm CL2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH DPD Total Chlorine Reagent Powder Pillows,25-ml (Cat. No. 14064-99)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

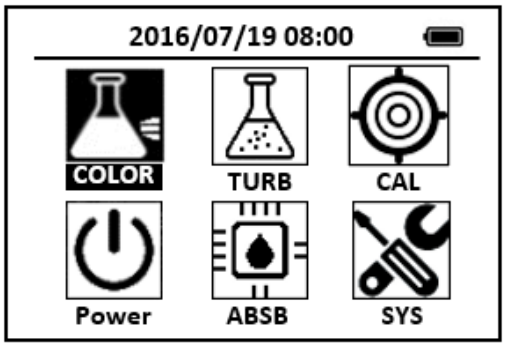

Figure 80

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CL2HR** icon.

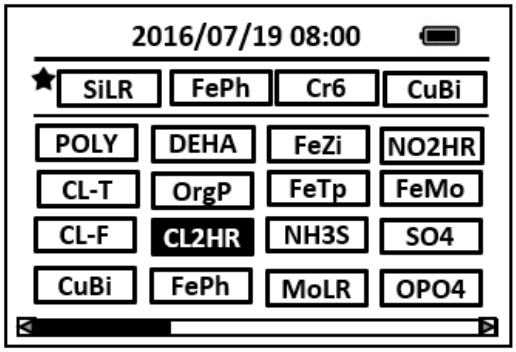

Figure 81

3. Press the OK key to enter **CL2HR** test program interface.

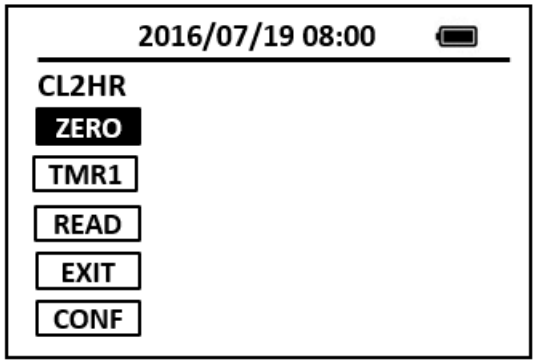

Figure 82

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

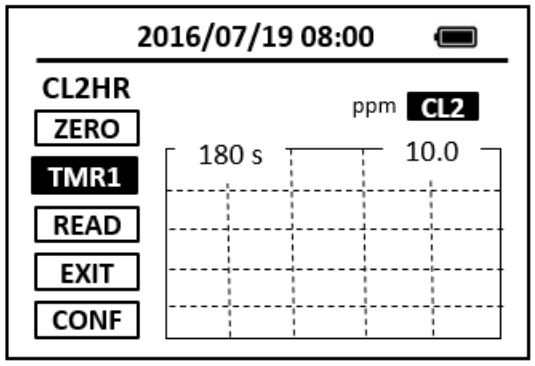

Figure 83

7. Take the sample vial out, add the contents of one 25-ml DPD Total Chlorine Reagent pillow to the sample vial, Cap and shake the sample vial about 20 seconds to dissolve.
   Note: A pink color will develop if chlorine is present.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

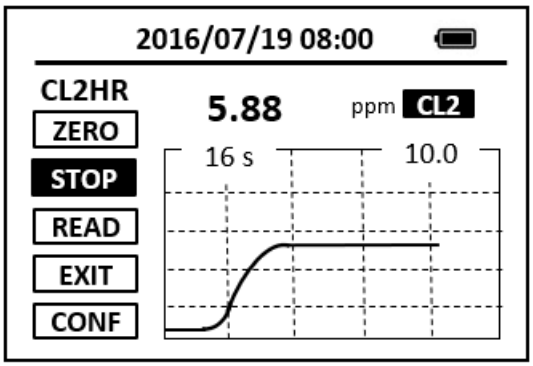

Figure 84

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 10070

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

16. Chlorine, Free, High Range - CL2HR

Test Program

Description： SP-800 Free Chlorine High Range Method (0.1-10 ppm CL2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH DPD Free Chlorine Reagent Powder Pillows,25-ml (Cat. No. 14070-99)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

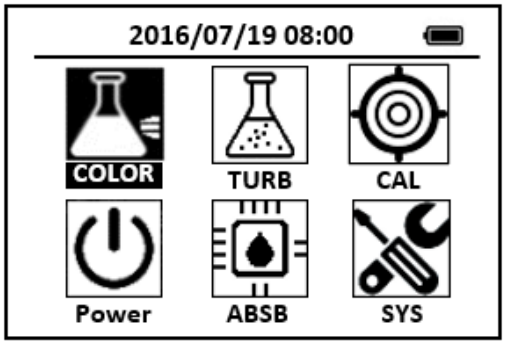

Figure 85

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CL2HR** icon.

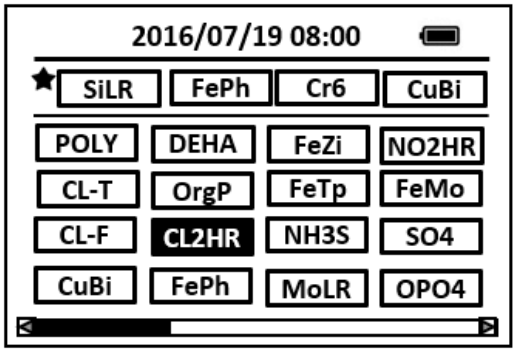

Figure 86

3. Press the OK key to enter **CL2HR** test program interface.

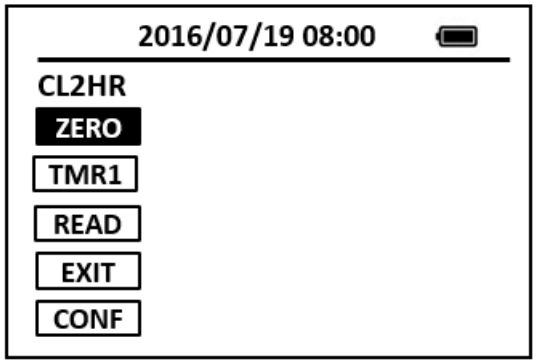

Figure 87

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

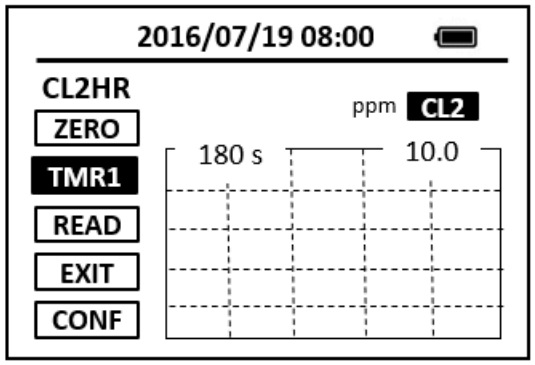

Figure 88

7. Take the sample vial out, add the contents of one 25-ml DPD Free Chlorine Reagent pillow to the sample vial, Cap and shake the sample vial about 20 seconds to dissolve.
   Note: A pink color will develop if chlorine is present.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

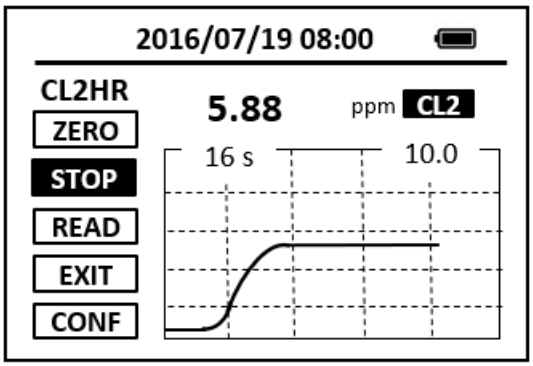

Figure 89

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 10069

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

17. Chlorine, Free, Ultra-High Range - CL2UH

Test Program

Description： SP-800 Free Chlorine Ultra-High Range Method (5-400 ppm CL2) (Iodimetr Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis CL2UH Reagent (PN: 31074)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

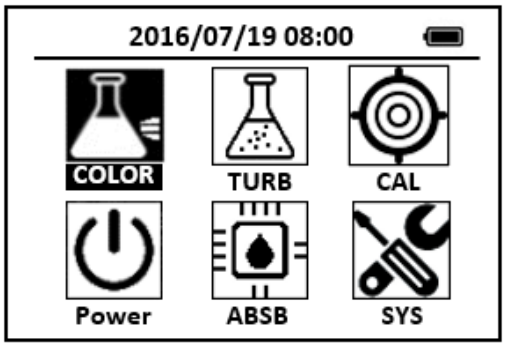

Figure 90

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CL2UH** icon.

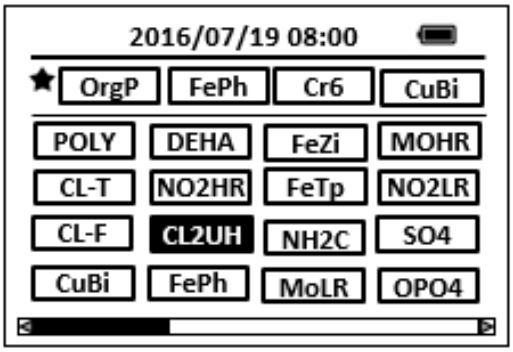

Figure 91

3. Press the OK key to enter **CL2UH** test program interface.

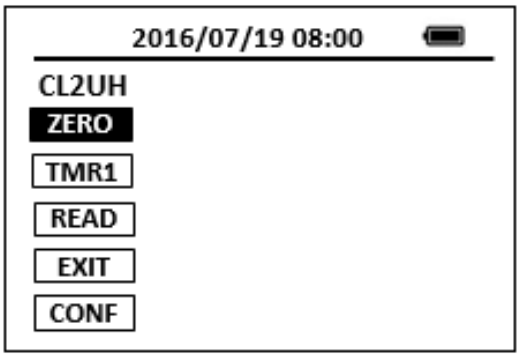

Figure 92

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

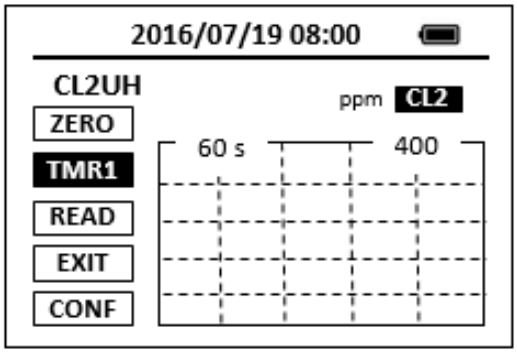

Figure 93

7. Take the sample vial out, add the contents of CL2UH reagent to the sample vial, cap and shake the sample vial to dissolve.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

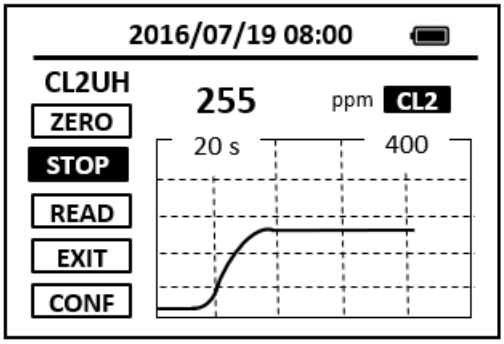

Figure 94

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

18. Chlorine, Free - CL-F

Test Program

Description： SP-800 Free Chlorine Method (0.02-2.20 ppm CL2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH DPD Free Chlorine Powder Pillows (Cat. No. 21055-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

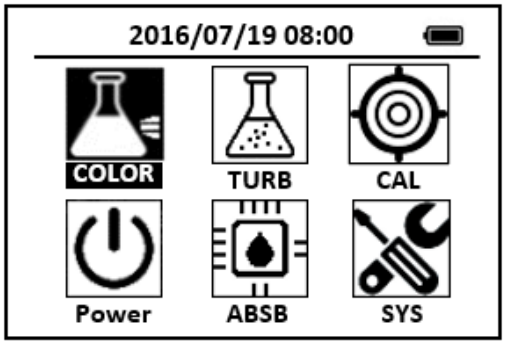

Figure 95

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CL-F** icon.

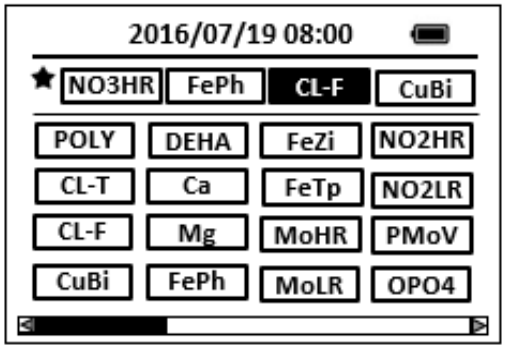

Figure 96

3. Press the OK key to enter **CL-F** test program interface.

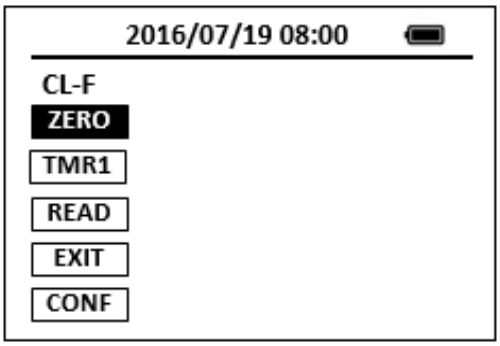

Figure 97

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

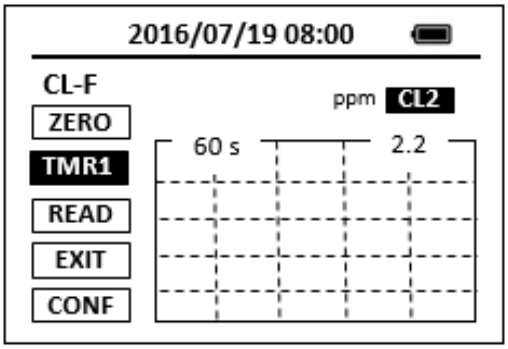

Figure 98

6. Take the sample vial out and add the contents of one DPD Free Chlorine Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: A pink color will develop if chlorine ion is present.
   Note: It the sample temporarily turns yellow after sample addition, it is due to high chlorine levels. Dilute a fresh sample and repeat the test.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

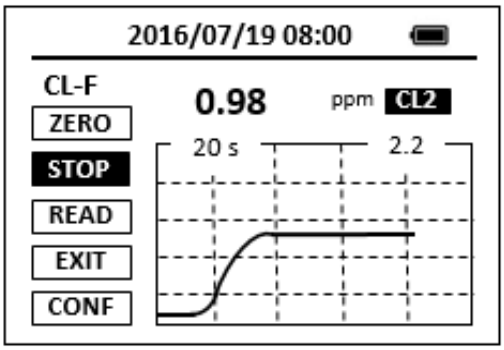

Figure 99

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8021

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

19. Chlorine, Free - CLTMB

Test Program

Description： SP-800 Free Chlorine Method (0.02-1.20 ppm CL2) (TMB Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis CLTMB Reagent (PN: 31075)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

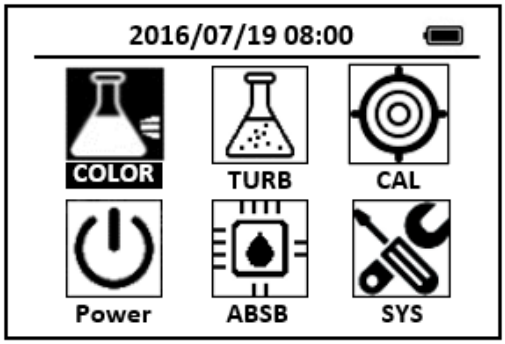

Figure 100

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLTMB** icon.

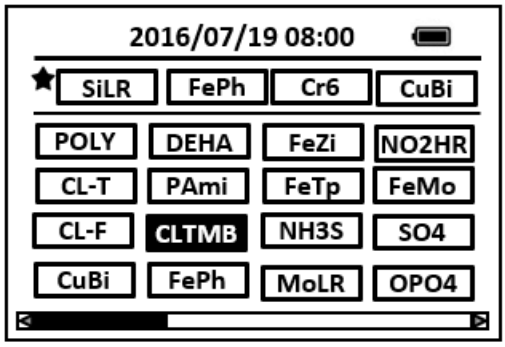

Figure 101

3. Press the OK key to enter **CLTMB** test program interface.

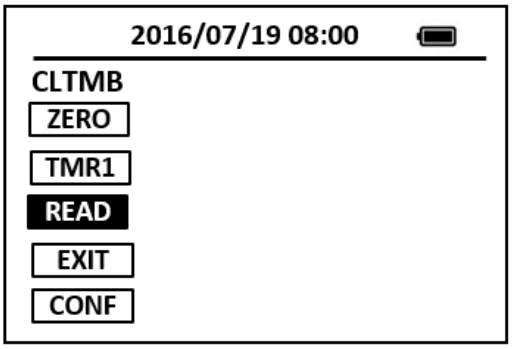

Figure 102

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

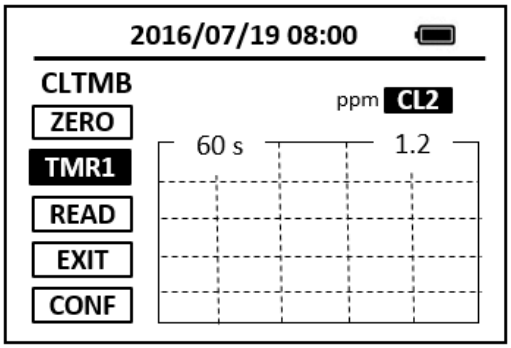

Figure 103

6. Take the sample vial out and add the CLTMB reagent to the sample vial. Swirl the vial to mix the reagent.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

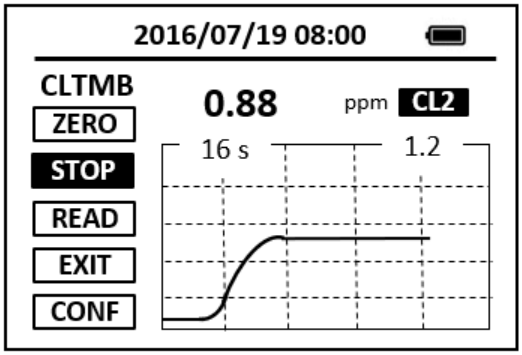

Figure 104

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

20. Chlorine Dioxide - CLO2

Test Program

Description： SP-800 Chlorine Dioxide Method (0.04-5 ppm CLO2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Chlorine Dioxide DPD/Glycine Reagent Set (Cat. No. 27709-00)
   Includes one of each:
   (1) DPD Free Chlorine Reagent Powder Pillows (Cat. No. 21055-69)
   (2) Glycine Reagent

Program:

1. Press OK Key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

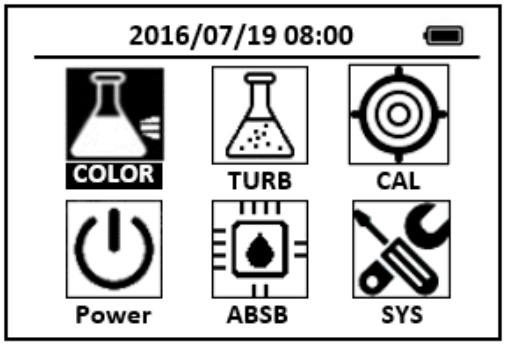

Figure 105

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLO2** icon.

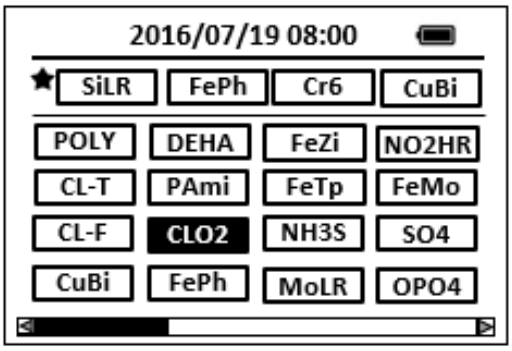

Figure 106

3. Press the OK key to enter **CLO2** test program interface.

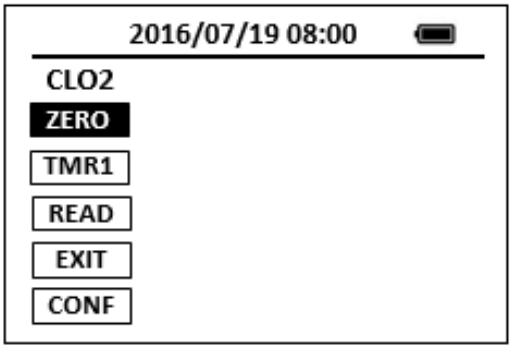

Figure 107

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis.
   Note: Wipe off any liquid or fingerprints before inserting the sample vial into the instrument.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

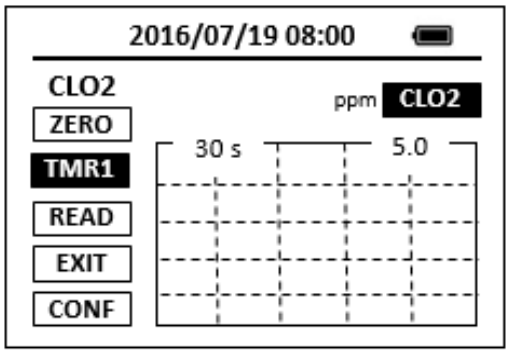

Figure 108

6. Take the sample vial out and add four drops of Glycine Reagent to the sample vial. Swirl to mix.
7. Add the contents of one DPD Free Chlorine Powder Pillow to the sample vial (the prepared sample). Cap the vial and swirl to mix.
   Note: A pink color will develop if free chlorine dioxide is present.
   Note: Perform step 8 within one minute of reagent addition.
8. Allow 30 seconds for undissolved powder to settle. Place the prepared sample vial back into the sample vial compartment and Press the **READ** key.
   Note: Wipe off any liquid or fingerprints before inserting the sample cell into the instrument.
9. Concentration value based on the last absorbance value measured will be calculated and displayed.

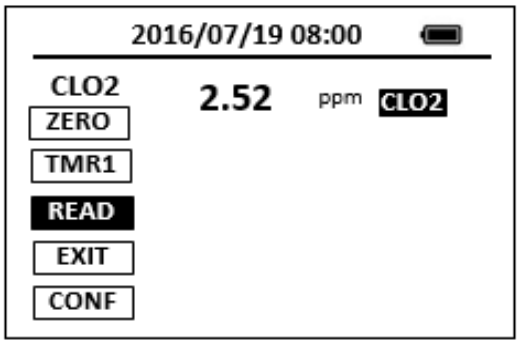

Figure 109

10. Press EXIT Key to return to the main page.

The method is compatible with HACH 10126

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

21. Chlorine Dioxide Direct Read Medium Range - CLO2D

Test Program

Description： SP-800 Chlorine Dioxide Direct Read Medium Range Method (7.3-50.0 ppm CLO2)

(Direct Reading Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

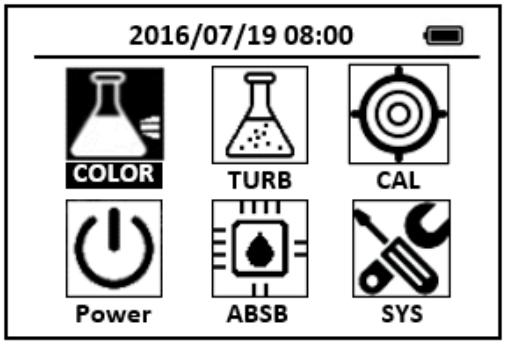

Figure 110

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLO2D** icon.

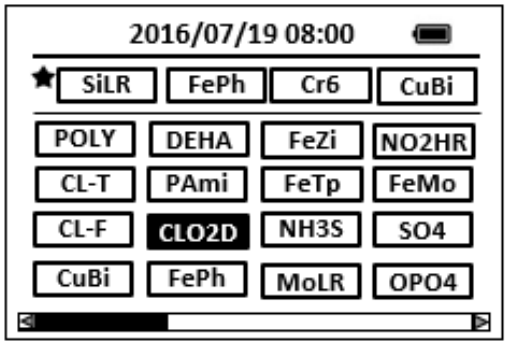

Figure 111

3. Press the OK key to enter **CLO2D** test program interface.

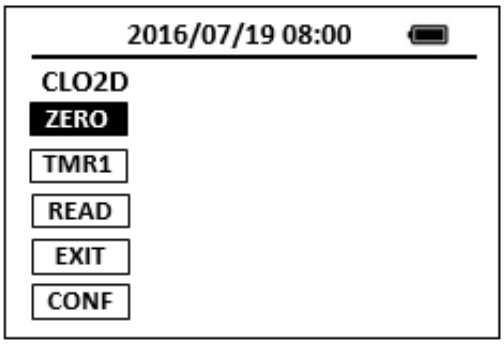

Figure 112

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
   Note: Analyze samples immediately after collection.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

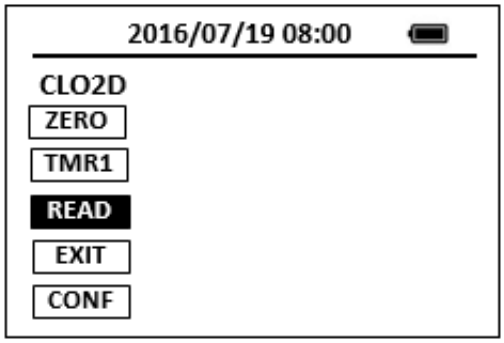

Figure 113

6. Fill a sample vial to the 10-ml line with sample (the prepared sample).
7. Use a soft cloth or lint free paper tissue to clean the sample vial.
8. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
9. Concentration value based on the last absorbance value measured will be calculated and displayed.

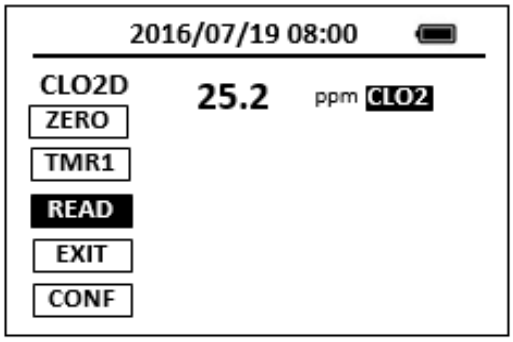

Figure 114

10. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8345

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

22. Chlorine Dioxide Direct Read High Range - CLO2H

Test Program

Description： SP-800 Chlorine Dioxide Direct Read High Range Method (200-1500 ppm CLO2)

(Direct Reading Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. On the main page, the screen will display six major feature groups.

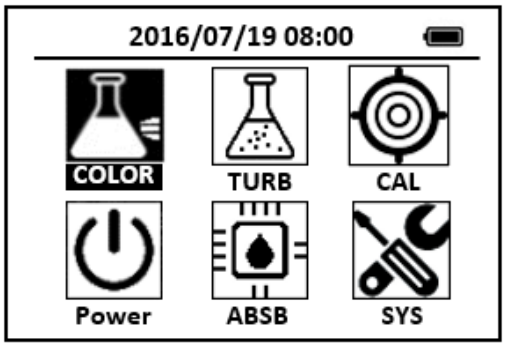

Figure 115

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CLO2H** icon.

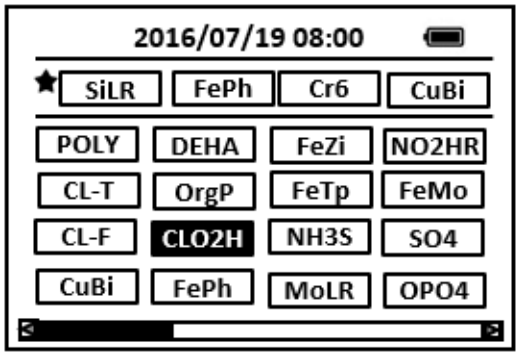

Figure 116

3. Press the OK key to enter **CLO2H** test program interface.

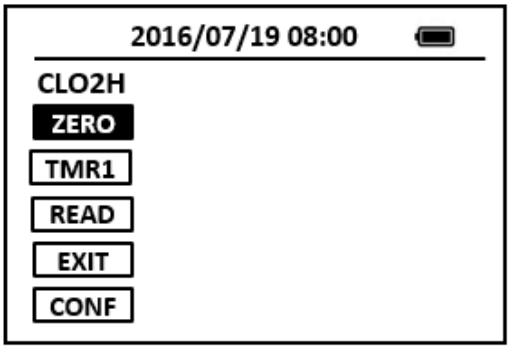

Figure 117

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
   Note: Analyze samples immediately after collection.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

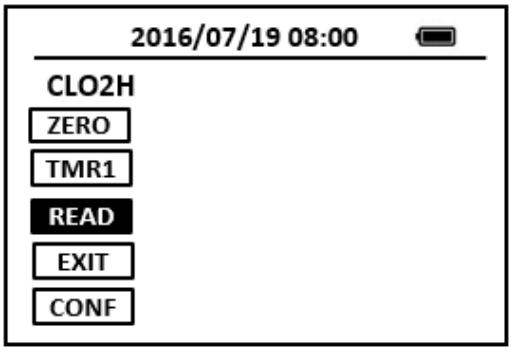

Figure 118

6. Fill a sample vial to the 10-ml line with sample (the prepared sample).
7. Use a soft cloth or lint free paper tissue to clean the sample vial.
8. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
9. Concentration value based on the last absorbance value measured will be calculated and displayed.

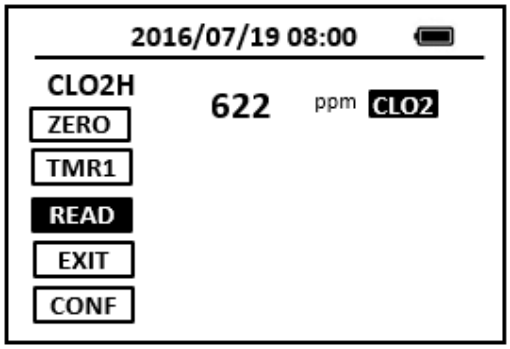

Figure 119

10. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

23. Chlorine, Total - CL-T

Test Program

Description： SP-800 Total Chlorine Method (0.02-2.20 ppm CL2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH DPD Total Chlorine Reagent Powder Pillows (Cat. No. 21056-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

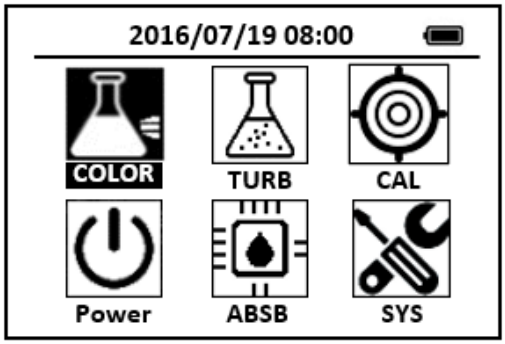

Figure 120

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CL-T** icon.

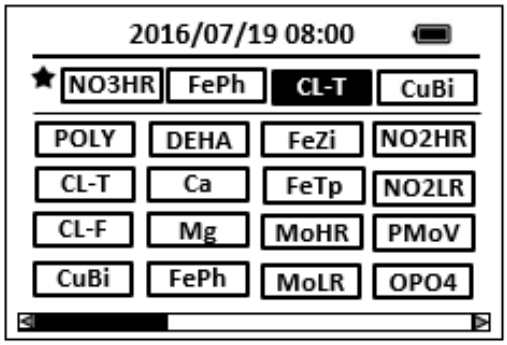

Figure 121

3. Press the OK key to enter **CL-T** test program interface.

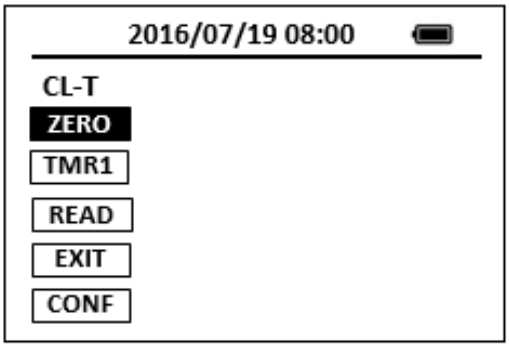

Figure 122

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

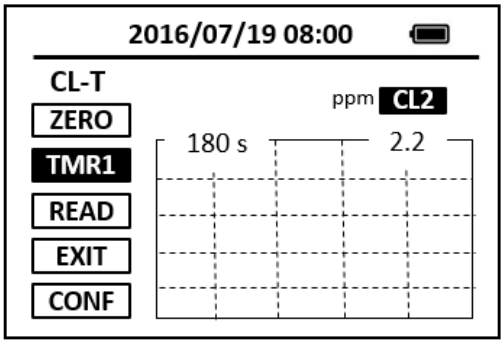

Figure 123

6. Take the sample vial out and add the contents of one DPD Total Chlorine Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: It is not necessary that all the powder dissolves.
   Note: A pink color will develop if chlorine ion is present.
   Note: It the sample temporarily turns yellow after sample addition, it is due to high chlorine levels. Dilute a fresh sample and repeat the test.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time

9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

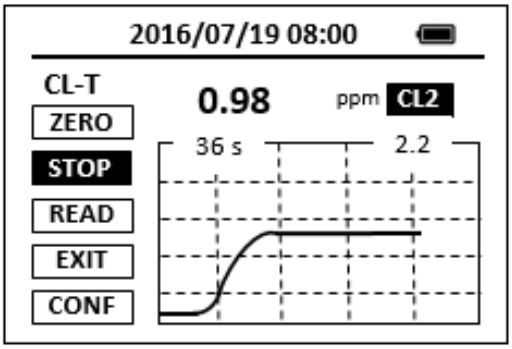

Figure 124

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8167

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

24. Cyanide - CN

Test Program

Description： SP-800 Cyanide Method (0.008 – 0.240 ppm CN) (Pyridine-Pyrazalone Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Cyanide Reagent Set (Cat. No. 24302-00)
   Includes:
   (1) CyaniVer 3 Cyanide Reagent Powder Pillows (Cat. No. 21068-69)
   (2) CyaniVer 4 Cyanide Reagent Powder Pillows (Cat. No. 21069-69)
   (3) CyaniVer 5Cyanide Reagent Powder Pillows (Cat. No. 21070-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

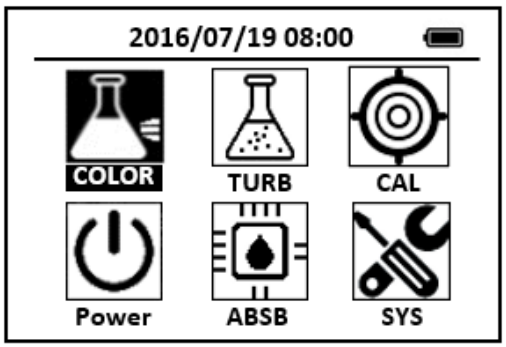

Figure 125

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CN** icon.

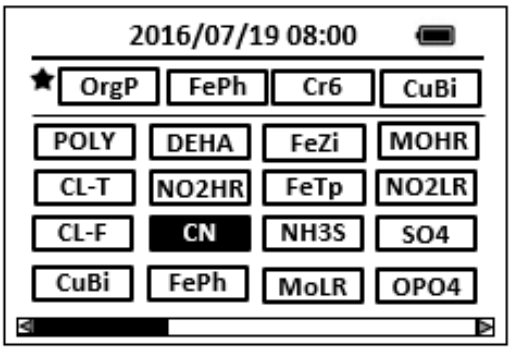

Figure 126

3. Press the OK key to enter **CN** test program interface.

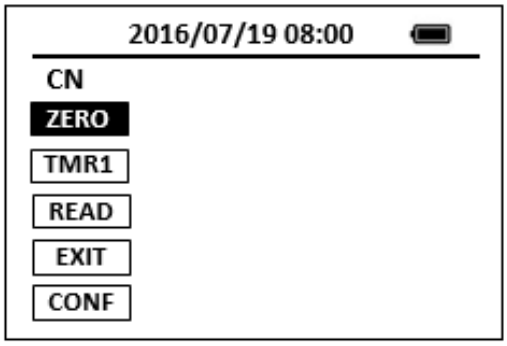

Figure 127

4. Fill a sample vial to the 10-ml line with sample.
   Note: Samples at less than 23 °C require a longer reaction time and samples at greater than 25 °C give low test results. Sample temperature must be 23-25 °C.
5. Add the contents of one CyaniVer 3 Cyanide Reagent Powder Pillow to the sample vial, Cap the vial and invert repeatedly to mix.
6. Press the **ZERO** key. Pyxis SP-800 will display the page.

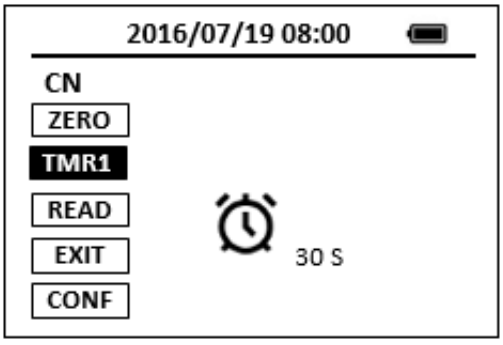

Figure 128

7. Press the **TMR1** key to start the method timer, a 30-second reaction period will begin. Shake the sample vial for the 30 seconds.
8. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to TMR2 key.

9. Press the **TMR2** key to start the method timer, a 30-second reaction period will begin. Let the sample vial sit undisturbed for this 30-second period.

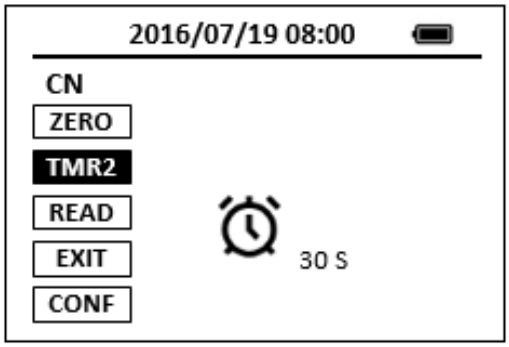

Figure 129

10. After the timer beeps, add the contents of one CyaniVer 4 Cyanide Reagent Powder Pillow. Swirl the vial to mix the reagent.
11. Shake the sample vial for ten seconds. Immediately proceed with Step 11.

    Note: Delaying the addition of the CyaniVer 5 Cyanide Reagent Powder for more than 30 seconds after the addition of the CyaniVer 4 Cyanide Reagent Powder will give lower test results.

    Note: Accuracy is not affected by undissolved CyaniVer 4 Cyanide Reagent Powder.

12. Add the contents of one CyaniVer 5 Cyanide Reagent Powder Pillow to the sample vial, Cap the vial and invert repeatedly to mix.
13. Shake vigorously to completely dissolve the CyaniVer 5 Cyanide Reagent Powder (the prepared sample).
14. Press the TMR3 key to start the method timer, a 30-minute reaction period will begin.

    Note: If cyanide is present, a pink color will develop which then turns blue after a few minutes.

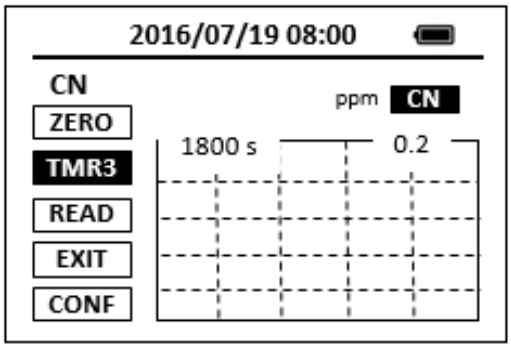

Figure 130

15. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key.
16. Fill another sample vial to the 10-ml line with sample (the blank sample).
17. Use a soft cloth or lint free paper tissue to clean the sample vial.
18. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
19. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
20. Concentration value based on the last absorbance value measured will be calculated and displayed.

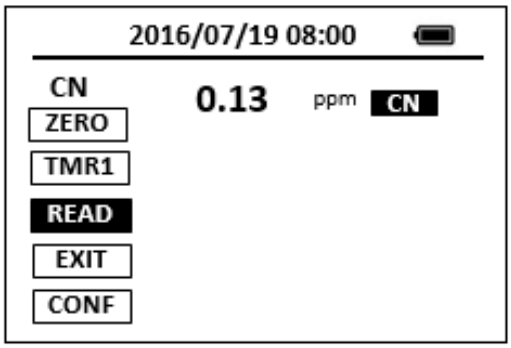

Figure 131

21. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8027

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

25. Color, True and Apparent - COLOR

Test Program

Description： SP-800 Color, True and Apparent Method (25-500 units) (APHA Platinum-Cobalt Standard Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Aspirator, vacuum
4. Filter Holder, 47 mm, 300 ml graduated
5. Filter, membrane, 47 mm, 0.45 microns
6. Flask, filtering, 500 ml
7. Stopper, No. 7, one hole

Program:

1. Assemble the filtering apparatus (membrane filter, filter holder, filter flask, and aspirator).
   Note: To test for apparent color, do not filter; begin at Step 4 and skip Step 5
2. Rinse the filter by pouring about 50 ml of deionized water through the filter. Discard the rinse water.
3. Pour another 50 ml of deionized water through the filter. Keep this for Step 4.
4. Fill a sample vial (the blank) with 10 ml of filtered deionized water. Discard the excess.
   Note: For apparent color use unfiltered deionized water.
5. Pour about 50 ml of sample through the filter.
6. Fill a second sample vial (the prepared sample) with 10 ml of the filtered sample.
7. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

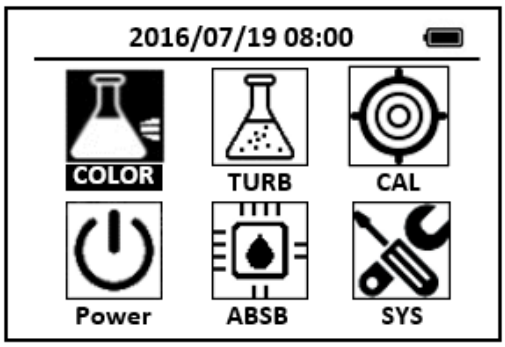

Figure 132

8. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **COLOR** icon.

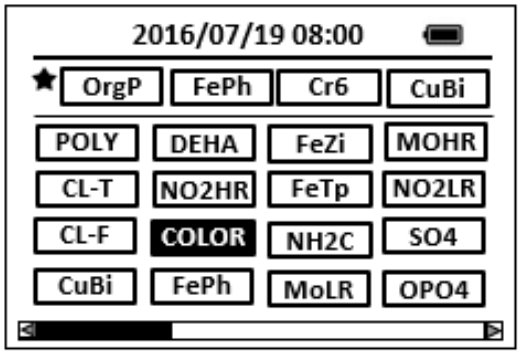

Figure 133

9. Press the OK key to enter **COLOR** test program interface.

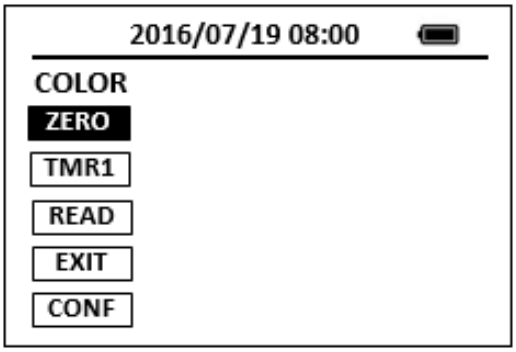

Figure 134

10. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

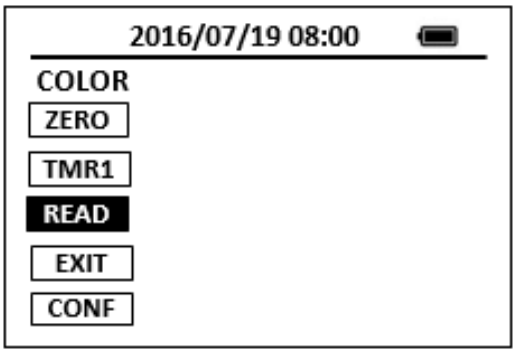

Figure 135

11. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
12. Concentration value based on the last absorbance value measured will be calculated and displayed.

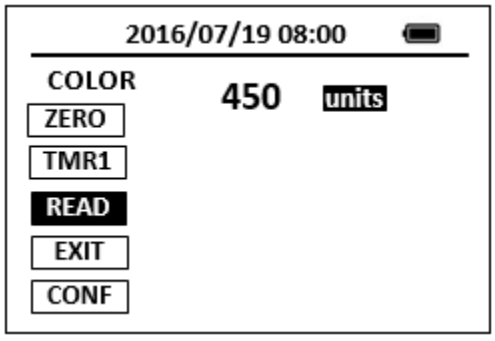

Figure 136

13. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8025

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds*

will wake up the instrument, and return to the original page if it has any measurement data.

26. Chromium, Hexavalent - Cr6

Test Program

Description：SP-800 Chromium Hexavalent Method (0.01-0.60 ppm Cr6+) (1,5-Diphenylcarbohydrazide Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH ChromaVer 3 Chromium Reagent Powder Pillows（Cat.No.12710-99）

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

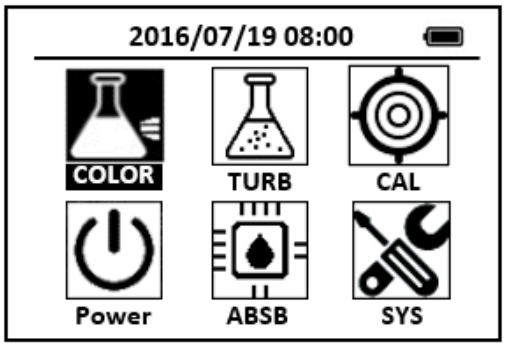

Figure 137

2. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **Cr6** icon.

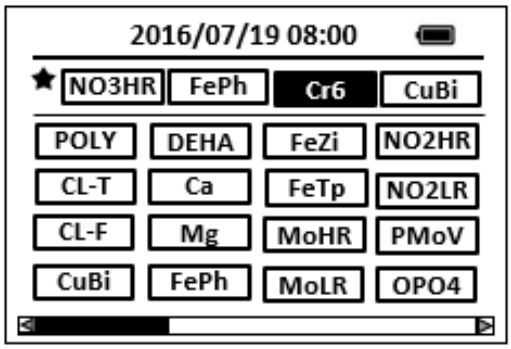

Figure 138

3. Press the OK key to enter **Cr6** test program interface.

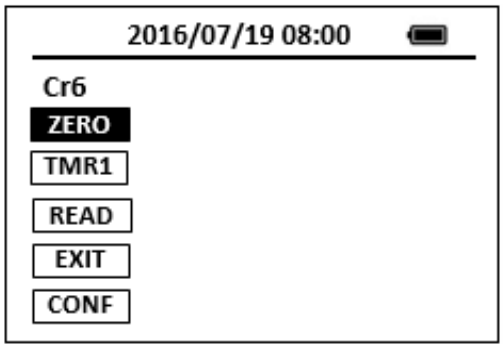

Figure 139

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

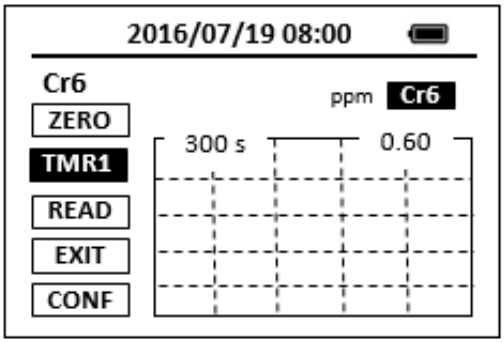

Figure 140

6. Take the sample vial out and add the ChromaVer 3 Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: A purple color will form if Cr6+ is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

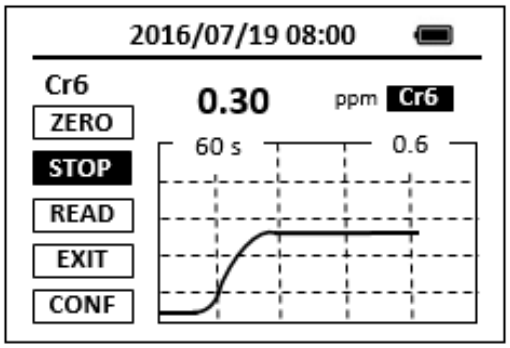

Figure 141

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8023

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

27. Chromium, Total - CrT

Test Program

Description：SP-800 Total Chromium Method (0.01-0.60 ppm Cr6) (Alkaline Hypobromite Oxidation Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Graduated Mixing Cylinder
4. HACH Total Chromium Reagent (Cat. No. 22425-00)
   Includes:
   (1) Acid Reagent Powder Pillows (Cat. No. 2126-99)
   (2) ChromaVer 3 Chromium Reagent Powder Pillows (Cat. No. 12066-99)
   (3) Chromium 1 Reagent Powder Pillows (Cat. No. 2043-99)
   (4) Chromium 2 Reagent Powder Pillows (Cat. No. 2044-99)

Program:

1. Press OK Key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

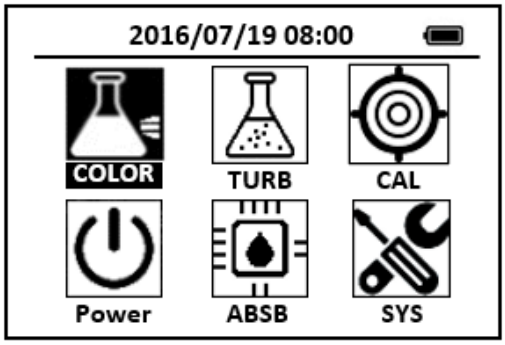

Figure 142

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CrT** icon.

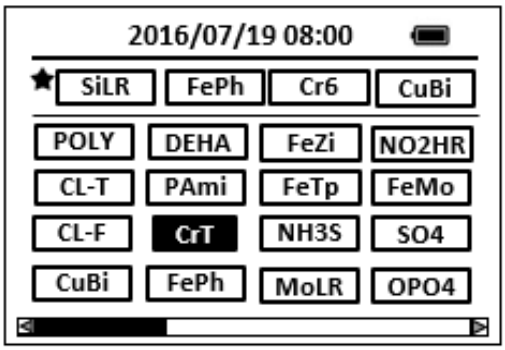

Figure 143

3. Press the OK key to enter **CrT** test program interface.

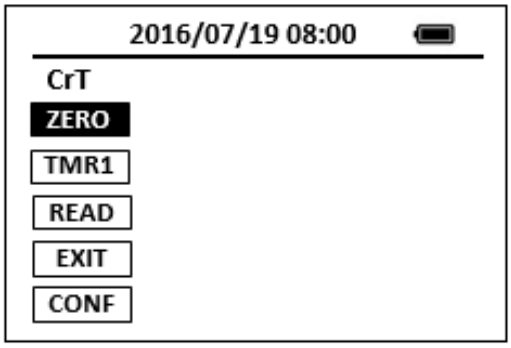

Figure 144

4. Fill a clean 25-ml sample vial with 25 ml of sample.
   Note: Adjust the pH to 2 or lower with nitric acid before analysis.
5. Add the contents of one Chromium 1 Reagent Powder Pillow (the prepared sample). Cap the vial and invert repeatedly to mix. Remove the cap.
6. Place the prepared sample into a boiling water bath.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

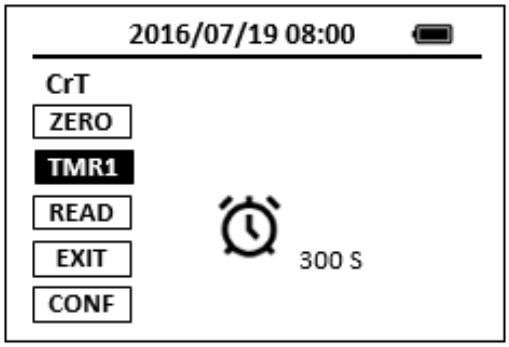

Figure 145

8. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.

9. When the timer reaches the preset time and the reaction is complete, the timer beeps. the cursor will automatically switch to **TMR2** Key.
10. Remove the prepared sample. Cap the vial. Use running tap water to cool the vial to 25 °C.

    Note: Use finger cots to handle the hot sample cell.
11. Add the contents of one Chromium 2 Reagent Powder Pillow. Cap the vial and invert repeatedly to mix. Remove the cap.
12. Add the contents of one Acid Reagent Powder Pillow. Cap the vial and invert repeatedly to mix. Remove the cap.
13. Add the contents of one ChromaVer 3 Chromium Reagent Powder Pillow. Cap the vial and invert repeatedly to mix.

    Note: A purple color will form if chromium is present.

    *Note: **ChromaVer 3** is white to tan in color. Replace brown or green powder. Undissolved powder does not affect accuracy.*
14. Press the **TMR2** key to start the method timer, a 5-minute reaction period will begin.

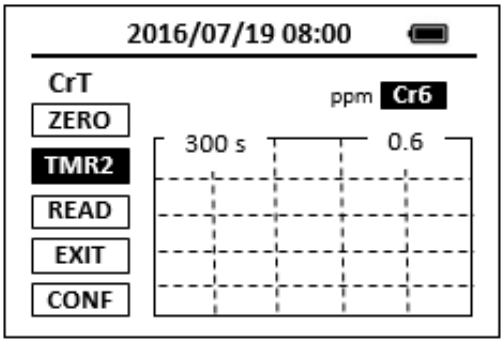

Figure 146

15. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to EXIT Key. Press the OK key to the icon menu-assisted.
16. After the timer beeps, fill a sample vial to the 10-ml line with raw water sample, this is the blank sample.
17. Pour 10 ml of sample from the 25-ml sample vial into a second sample vial, this is the prepared sample.
18. Use a soft cloth or lint free paper tissue to clean the sample vial.
19. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.

20. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key. Concentration value based on the last absorbance value measured will be calculated and displayed.

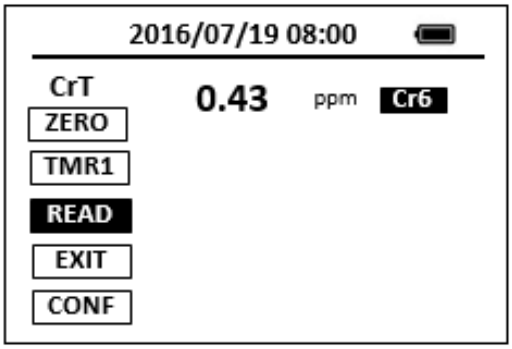

Figure 147

21. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8024

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

28. Copper - CuBi

Test Program

Description： SP-800 Copper Method (0.02-5.00 ppm Cu) (Bicinchoninate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH CuVer 1 Copper Reagent Powder Pillows (Cat. No. 21058-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

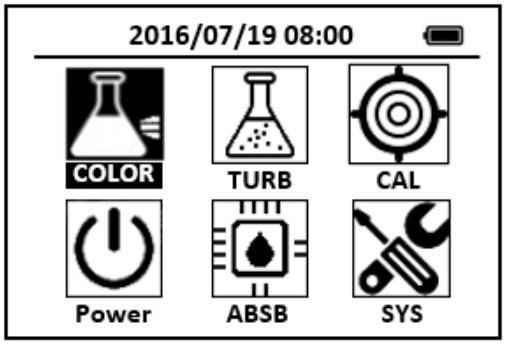

Figure 148

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CuBi** icon.

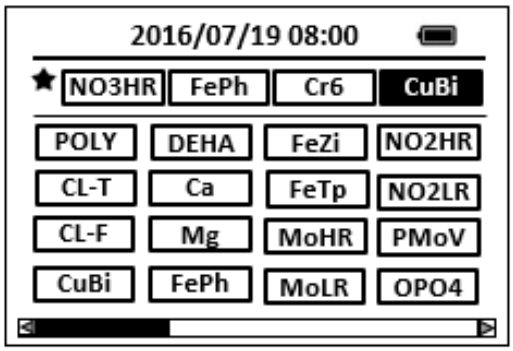

Figure 149

3. Press the OK key to enter **CuBi** test program interface.

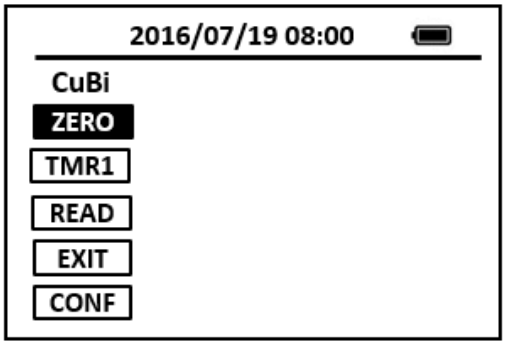

Figure 150

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Adjust the pH of acid-preserved samples to 4-6 with 8 N KOH before analysis. Do not exceed pH 6 or copper may precipitate.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

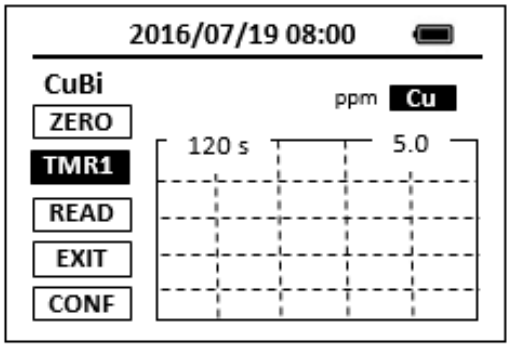

Figure 151

6. Take the sample vial out and add the contents of one CuVer 1 Copper Powder Pillow reagent to the sample vial. Swirl the vial to mix the reagent.
   Note: A purple color will develop if copper ion is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
   Note: Accuracy is not affected by undissolved powder.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

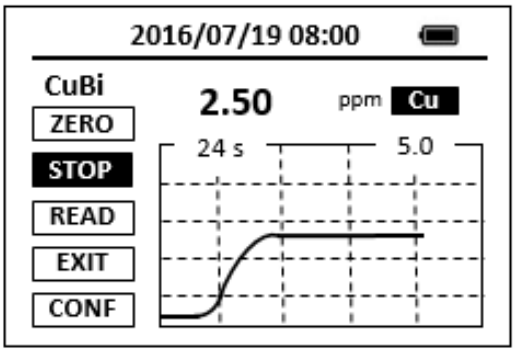

Figure 152

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8506

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

29. Copper - CuLR

Test Program

Description： SP-800 Copper Low Range Method (0.006-0.21 ppm Cu) (Porphyrin Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Copper Reagent (Cat. No. 26033-00)
   Includes:
   (1) Copper Masking Reagent Powder Pillows (Cat. No. 26034-49)
   (2) Porphyrin 1 Reagent Powder Pillows (Cat. No. 26035-49)
   (3) Porphyrin 2 Reagent Powder Pillows (Cat. No. 26036-49)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

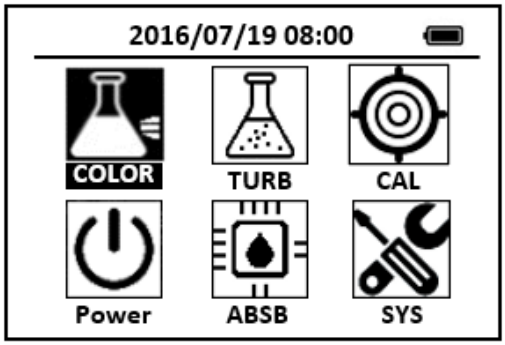

Figure 153

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CuLR** icon.

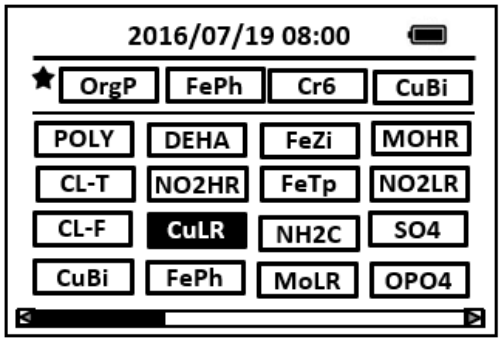

Figure 154

3. Press the OK key to enter **CuLR** test program interface.

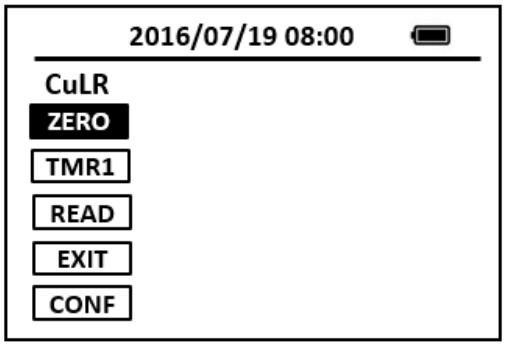

Figure 155

4. Fill two sample vials with 10 ml of sample.
   Note: Wash all glassware with detergent. Rinse with tap water. Rinse again with Nitric Acid Solution 1:1. Rinse a third time with copper-free, deionized water.
5. Add the contents of Copper Masking Reagent Powder Pillow to one of the sample vials (the blank sample). Cap the vial and invert to dissolve.
   Note: The other sample vial is the prepared sample.
6. Add the contents of one Porphyrin 1 Reagent Powder Pillow to each sample vial. Cap the vial and invert to dissolve.
7. Add the contents of one Porphyrin 2 Reagent Powder Pillow to each sample vial. Cap the vial and invert to dissolve.
   Note: The yellow color will turn blue momentarily. If any copper is present, the yellow color will return.
8. Press the **ZERO** key. Pyxis SP-800 will display the page.

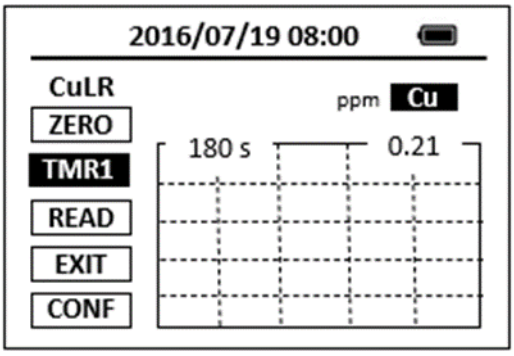

Figure 156

9. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed.

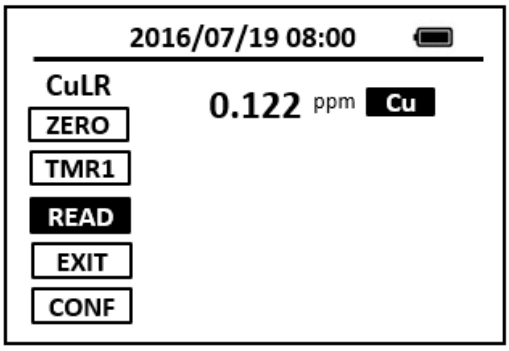

Figure 157

15. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8143

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized*

water.

3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

30. Cyanuric Acid - CYAN

Test Program

Description： SP-800 Cyanuric Acid Method (7.0-55.0 ppm CYAN) (Turbidimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Cyanuric Acid 2 Reagent Powder Pillow (Cat.No.2460-66)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

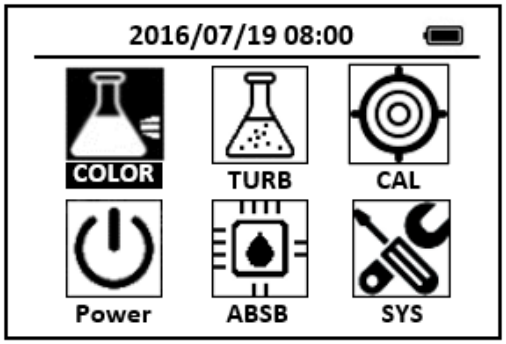

Figure 158

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **CYAN** icon.

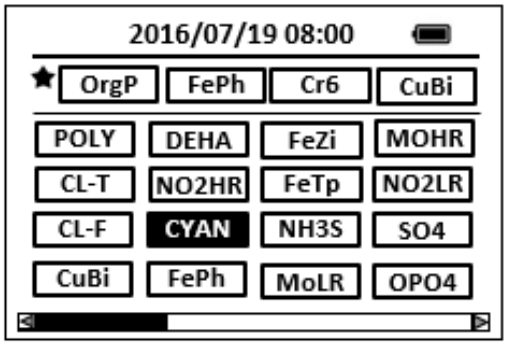

Figure 159

3. Press the OK key to enter **CYAN** test program interface.

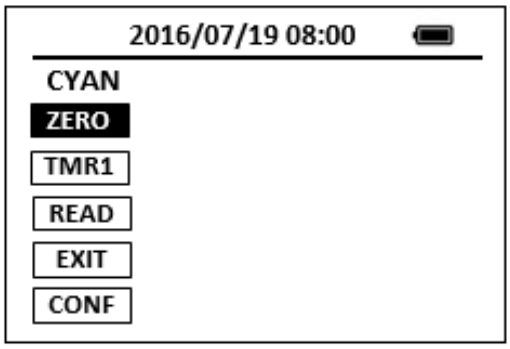

Figure 160

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Filtering is required for highly turbid samples.
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

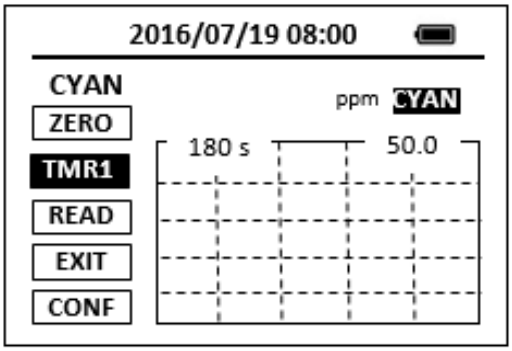

Figure 161

7. Take the sample vial out, add the contents of one Cyanuric Acid 2 Reagent Powder Pillow to the sample vial, Swirl the vial to mix the reagent.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
   Note: A white turbidity will form if cyanuric acid is present.
   Note: Accuracy is not affected by undissolved powder.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.
    Note: Clean sample cells with soap, water and a brush soon after each test to prevent a white film from forming.

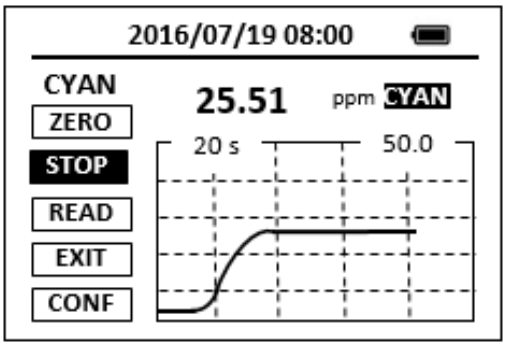

Figure 162

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8139

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

31. Diethyl hydroxylamine - DEHA

Test Program

Description：SP-800 Diethyl hydroxylamine Method (0.009-0.500 ppm DEHA) (Iron Reduction Method for Oxygen Scavengers)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25ml Sample Vial
4. HACH Oxygen Scavenger Reagent Set (Cat. No. 24466-00)
   Includes:
   (1) DEHA Reagent 1 Powder Pillow (Cat. No. 21679-69)
   (1) DEHA Reagent 2 Powder Pillow (Cat. No. 21680-42)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

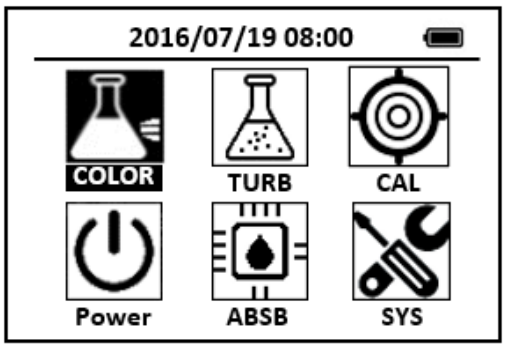

Figure 163

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **DEHA** icon.

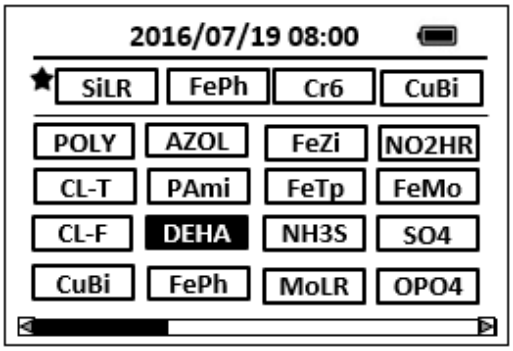

Figure 164

3. Press the OK key to enter **DEHA** test program interface.

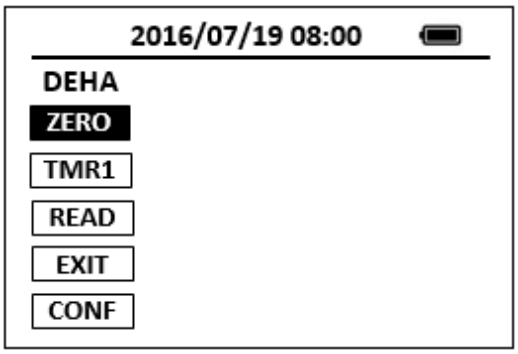

Figure 165

4. Fill a sample vial to the 25-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 25-ml line with sample (the prepared sample).
   Note: The sample temperature should be 25 ± 3°C (77 ± 5 °F).
   Note: When testing for compounds that react quickly with oxygen at room temperature, stopper the vial containing the sample in Steps 5–14.
6. Add the contents of one DEHA Reagent 1 Powder Pillow to each sample vial. Cap the vials and invert to mix.
7. Add exactly 0.5 ml of DEHA Reagent 2 Solution to each sample vial. Cap and swirl to mix. Place both sample vials in the dark.
   Note: A purple color will slowly develop if DEHA is present.
8. Press the ZERO key. Pyxis SP-800 will display the page.

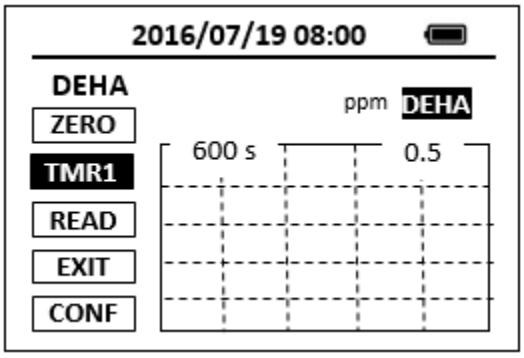

Figure 166

9. Press the **TMR1** key to start the method timer, a 10-minute reaction period will begin. For hydroquinone, allow only a two-minute reaction period
   Note: Both sample vials must remain in the dark for the entire reaction period.
   Note: Temperature and reaction time affect results.
10. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Pour 10 ml solution out of the 25-ml blank sample vial (the blank sample).
12. Pour 10 ml solution out of the 25-ml prepared sample vial (the prepared sample).
13. Use a soft cloth or lint free paper tissue to clean the 10 ml sample vial.
14. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
15. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
16. Concentration value based on the last absorbance value measured will be calculated and displayed.

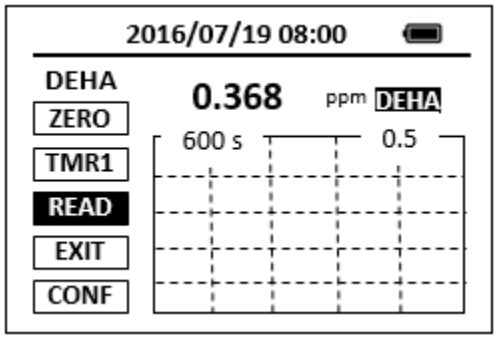

Figure 167

17. Press **EXIT** key to return to the main page.

Other Oxygen Scavengers

To determine other oxygen scavengers, perform the test as directed above, then multiply the DEHA result by the appropriate factor below:

Table 2

Oxygen Scavenger	Factor
Erythorbic Acid (Iso-ascorbic acid)	3.5
Hydroquinone	2.5
Methylethylketoxime (MEKO)	4.1
Carbohydrazide	1.3

The method is compatible with HACH 8140

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

32. Dissolved Oxygen-DO

Test Program

Description： SP-800 Dissolved Oxygen Method (0.5 -10.0 ppm O2) (Iodimetry Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis DO Reagent (PN: 31119)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

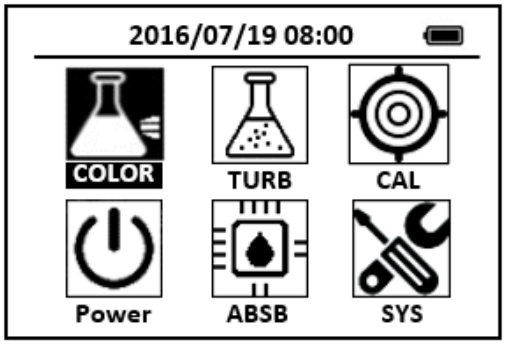

Figure 168

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **DO** icon.

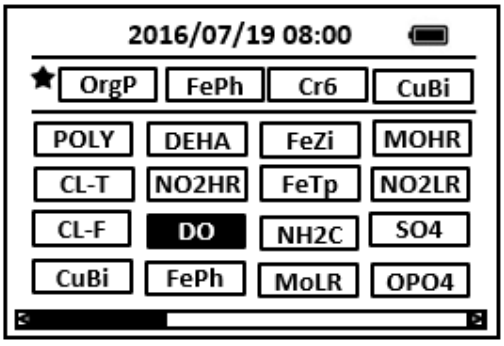

Figure 169

3. Press the OK key to enter **DO** test program interface.

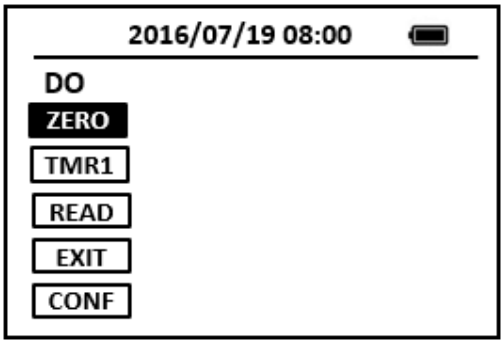

Figure 170

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).

   Note: To avoid air entering the water sample, gently immerse the bottle into the sample water or use a pipette to take deep water from the sample water and inject it along the bottom of the colorimetric bottle.
6. Add three drops of DO-1 Solution to each sample vial. Swirl the vial to mix the reagent.
7. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

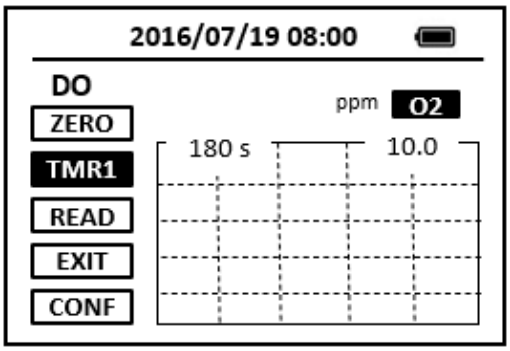

Figure 171

8. Add the contents of one DO-2 reagent to the prepared sample vial. Swirl the vial to mix the reagent.
9. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin**.**
10. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key.
11. Add three drops of DO-3 Solution to the sample vial. Swirl the vial to mix the reagent.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.

13. Repeat step 2, place the blank sample into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. Concentration value based on the last absorbance value measured will be calculated and displayed.

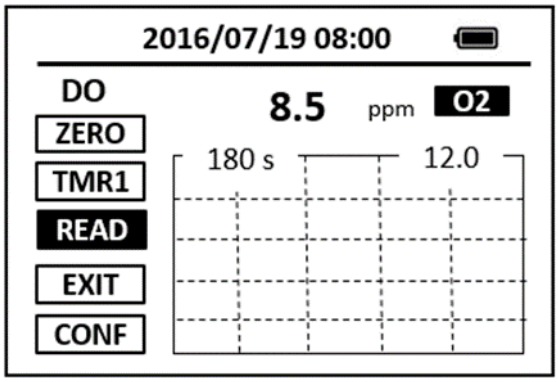

Figure 172

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

33. Fluoride - F

Test Program

Description： SP-800 Fluoride Method (0.05-2.00 ppm F) (SPADNS Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH SPADNS Reagent for Fluoride (Cat.No. 444-49)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

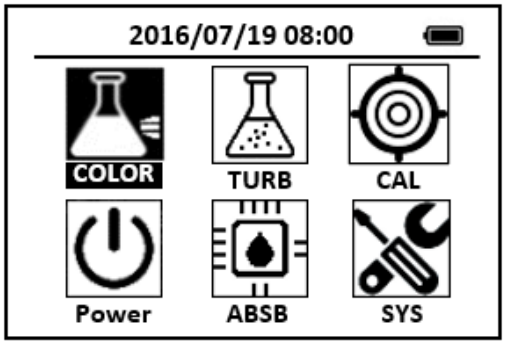

Figure 173

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **F** icon.

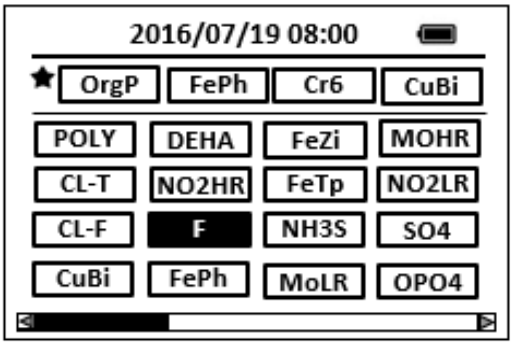

Figure 174

3. Press the OK key to enter **F** test program interface.

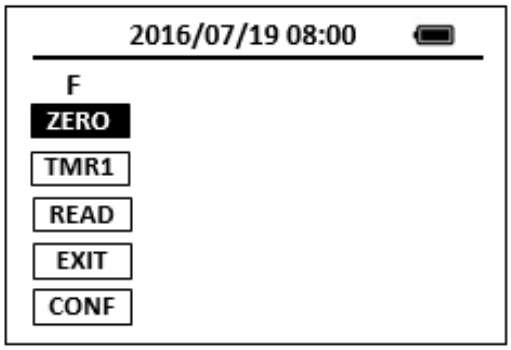

Figure 175

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
   Note: The sample and blank should be at the same temperature (±1 °C). Temperature adjustments may be made before or after reagent addition.
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
6. Add 2.0 ml of SPADNS Reagent into each sample vial. Cap the vials and invert to mix.
   Note: F Reagent is toxic and corrosive; use care while measuring. Use a pipet filler.
   Note: The F Reagent must be measured accurately.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

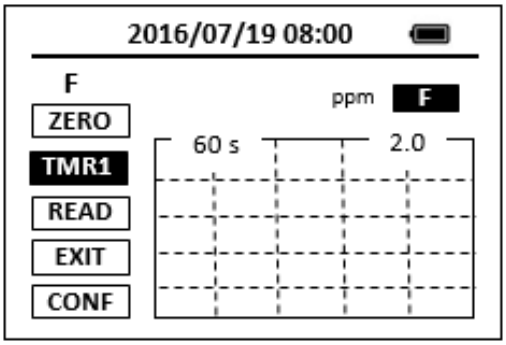

Figure 176

8. Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
9. When the timer reaches the preset time and the reaction is complete, the timer beeps, After the timer beeps, the cursor will automatically switch to **EXIT** Key. Press the OK Key to the icon menu-assisted.
10. Use a soft cloth or lint free paper tissue to clean the sample vial.
11. Place the prepared blank into the Pyxis SP-800 sample vial compartment. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** Key.

12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
13. A new concentration value based on the last absorbance value measured will be calculated and displayed.

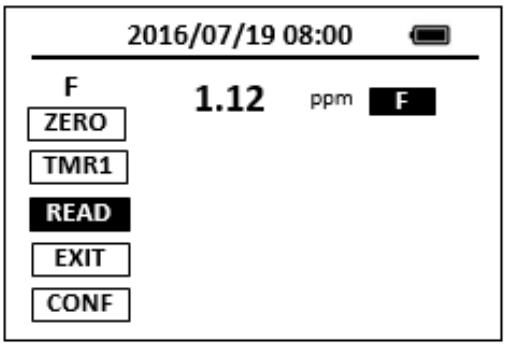

Figure 177

14. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8029

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

34. Total Iron - FeMo

Test Program

Description： SP-800 Total Iron Method (0.03-1.80 ppm Fe) (Ferro MO Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Sample Vial
4. 50-ml Graduated Mixing Cylinder
5. HACH FerroMo Reagent Set (Cat.No.25448-00)
   Includes:
   (1) FerroMo Iron Reagent 1 Powder Pillows (Cat. No. 25437-68)
   (2) FerroMo Iron Reagent 2 Powder Pillows (Cat. No. 25438-66)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

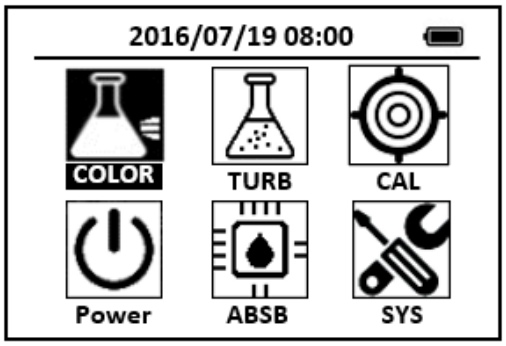

Figure 178

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **FeMo** icon.

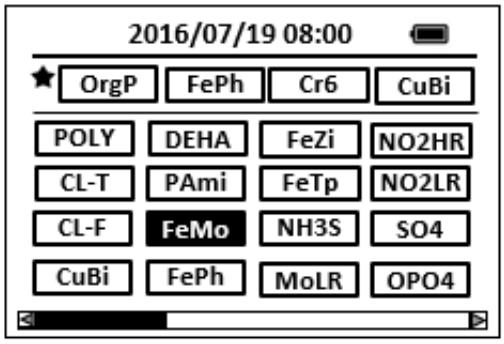

Figure 179

3. Press the OK key to enter **FeMo** test program interface.
   Note: Determination of total iron requires digestion

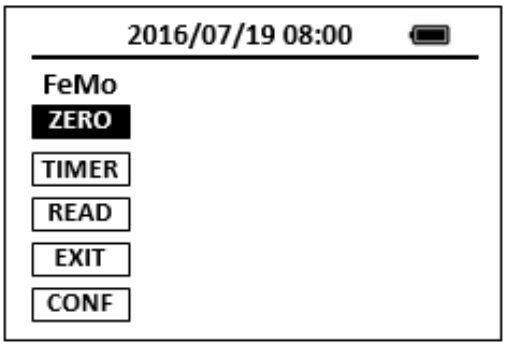

Figure 180

4. Fill a graduated mixing cylinder to the 50-ml line with sample.
   Note: A sample pH of less than 3 or greater than 4 after reagent addition may inhibit color formation, cause the developed color to fade, or result in turbidity. Adjust the sample pH before reagent addition to between 3 and 5 using a pH meter or pH paper. Drop by drop, add an appropriate amount of acid (1.0 N Sulfuric Acid Solution) or base (1.0 N Sodium Hydroxide Standard Solution).
   Note: Rinse glassware with 1:1 Hydrochloric Acid Solution. Rinse again with deionized water. This removes iron deposits which can cause slightly high results.
5. Add the contents of one FerroMo Iron Reagent 1 Powder Pillow to 50-ml sample vial, Swirl the vial to mix the reagent. This is the prepared sample.
6. Transfer 25 ml of the prepared sample to a 25-ml sample Vial.
7. Add the contents of one FerroMo Iron Reagent 2 Powder Pillow to 25-ml sample vial, Cap the vial and shake for 30 seconds.
8. Press the **ZERO** key. Pyxis SP-800 will display the page.

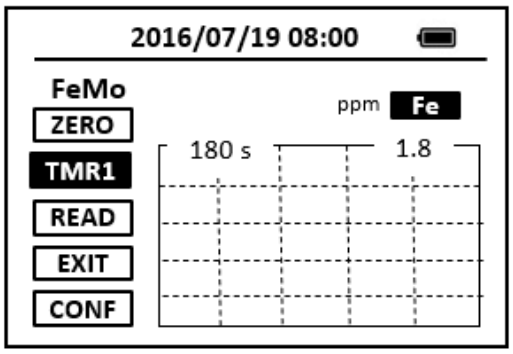

Figure 181

9. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
   Note: A blue color will develop if iron is present.
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, After the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Pour 10-ml solution from the 25ml sample vial (the prepared sample).
12. Pour 10-ml solution from the 50ml graduated mixing cylinder (the blank sample).
13. Use a soft cloth or lint free paper tissue to clean the sample vial.
14. Place the prepared blank into the Pyxis SP-800 sample vial compartment. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
    Note: For samples containing high levels of molybdate (≥100 mg/L), read the sample immediately after zeroing the blank.
15. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
16. Concentration value based on the last absorbance value measured will be calculated and displayed.

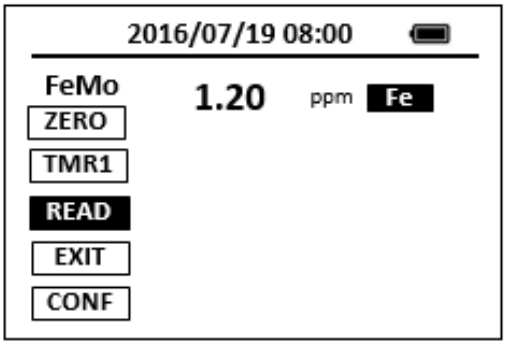

Figure 182

17. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8365

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

35. Total Iron - FePh

Test Program

Description： SP-800 Total Iron Method (0.03-3.00 ppm Fe) (1,10 phenanthroline Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH FerroVer Iron Reagent Powder Pillows (Cat.No.21057-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

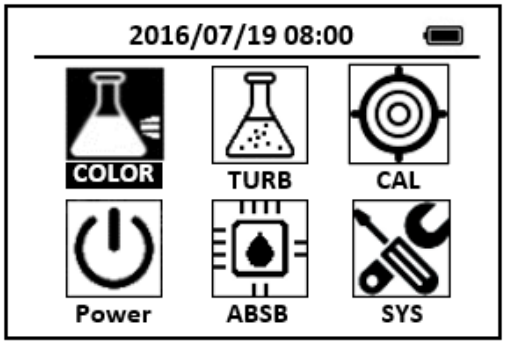

Figure 183

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **FePh** icon.

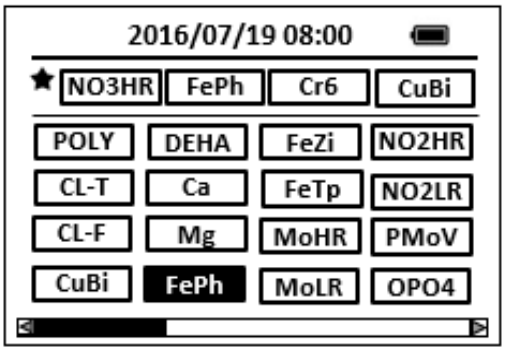

Figure 184

3. Press the OK key to enter **FePh** test program interface.

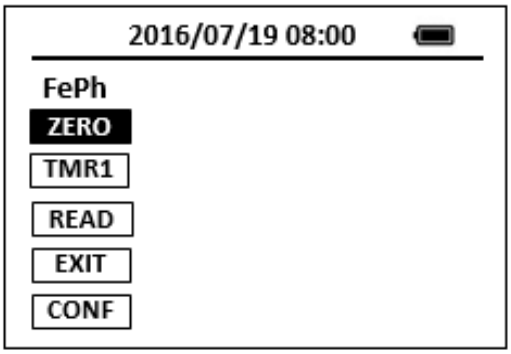

Figure 185

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: For turbid samples, treat the blank with one 0.1-gram scoop of Rover Rust Remover. Swirl to mix.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

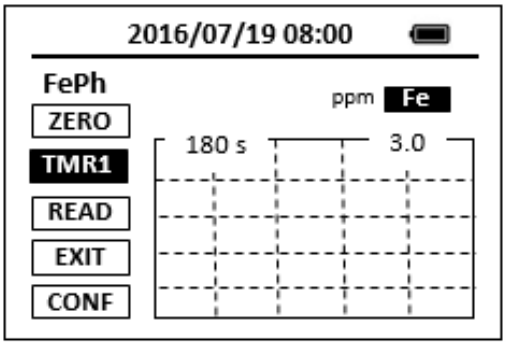

Figure 186

6. Take the sample vial out and add the contents of one FerroVer Iron Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: Accuracy is not affected by undissolved powder.
   Note: An orange color will develop if iron ion is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
   Note: Samples containing visible rust should be allowed to react at least five minutes.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time

9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

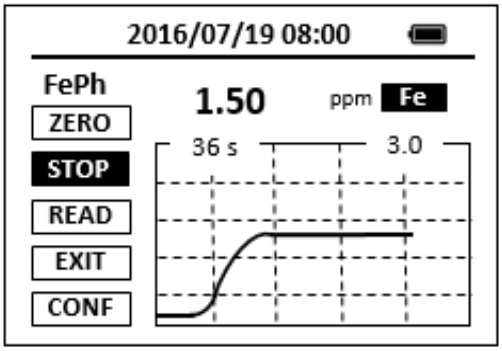

Figure 187

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8008

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

36. Total Iron - FeSal

Test Program

Description： SP-800 Total Iron Method (0.05-5.0 ppm Fe) (5-Sulfosalicylic Acid Dihydrate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis FeSal Reagent (PN:31078)
   Includes:
   (1) FeSal -1
   (2) FeSal -2

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

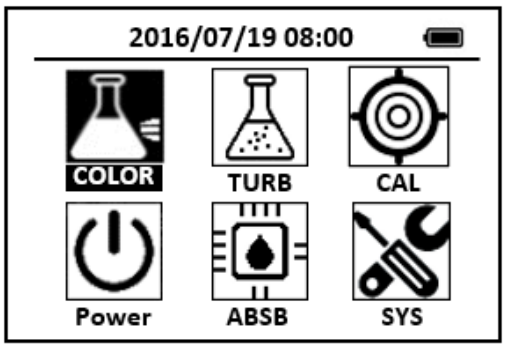

Figure 188

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **FeSal** icon.

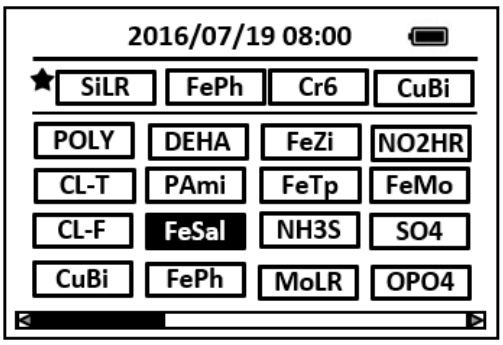

Figure 189

3. Press the OK key to enter **FeSal** test program interface.

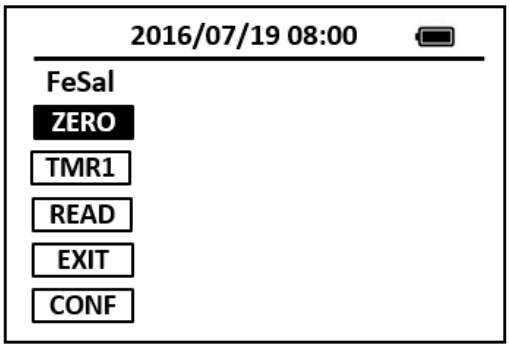

Figure 190

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

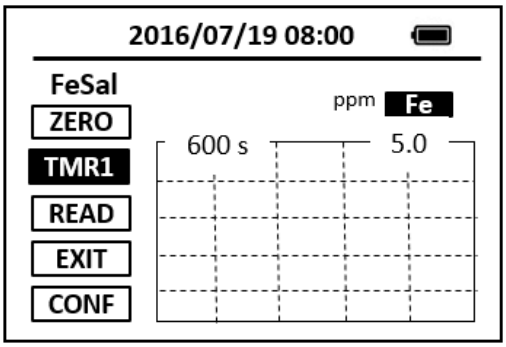

Figure 191

6. Take the sample vial out and add the FeSal-1 reagent to the sample vial. Swirl the vial to mix the reagent.
7. Add the FeSal-2 reagent to the sample vial. Swirl the vial to mix the reagent.

8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 10-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

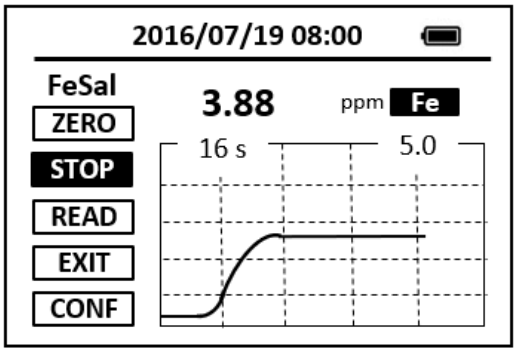

Figure 192

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

37. Total Iron - FeTp

Test Program

Description： SP-800 Iron Method (0.04-1.80 ppm Fe) (TPTZ Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH TPTZ Iron Reagent Powder Pillows (Cat. No. 26087-99)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

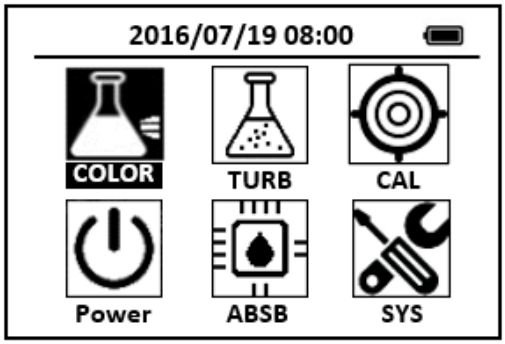

Figure 193

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **FeTp** icon.

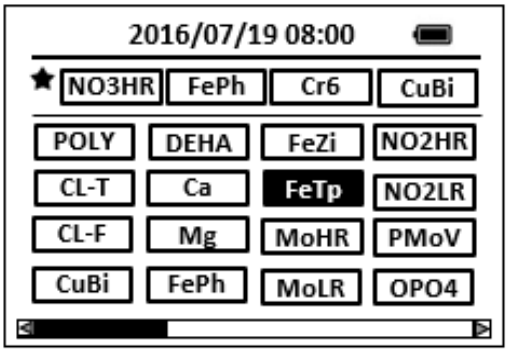

Figure 194

3. Press the OK key to enter **FeTp** test program interface.
   Note: Total iron determination needs a prior digestion.

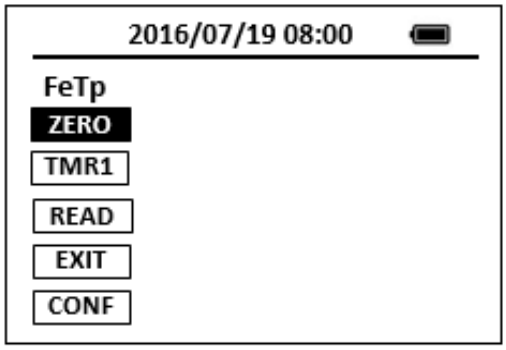

Figure 195

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Sample pH is important in this test.
   Note: Rinse glassware with a 1:1 hydrochloric acid and deionized water before use to avoid errors due to iron deposits on the glass.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

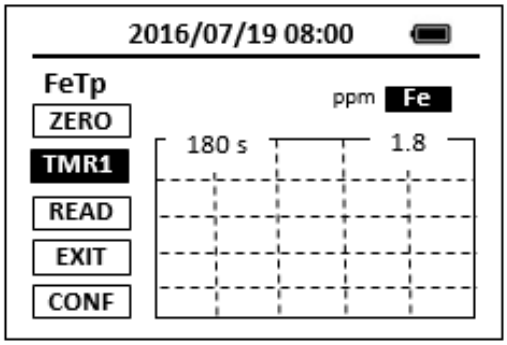

Figure 196

6. Take the sample vial out and add the contents of one TPTZ Iron Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent. Cap and shake the cell for 30 seconds.
   Note: A blue color will develop if iron ion is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.

9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

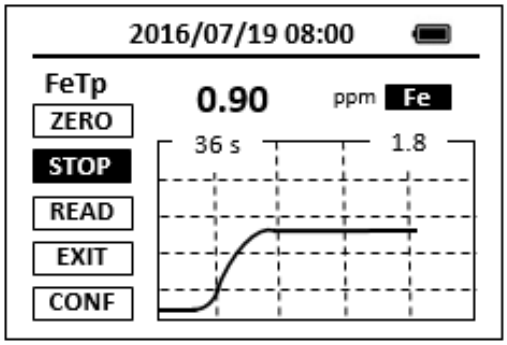

Figure 197

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8112

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

38. Total Iron - FeZi

Test Program

Description： SP-800 Total Iron Method (0.011-1.300 ppm Fe) (Ferrozine Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Sample Vial
4. HACH FerroZine Iron Reagent Solution Pillows (Cat. No. 2301-66)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

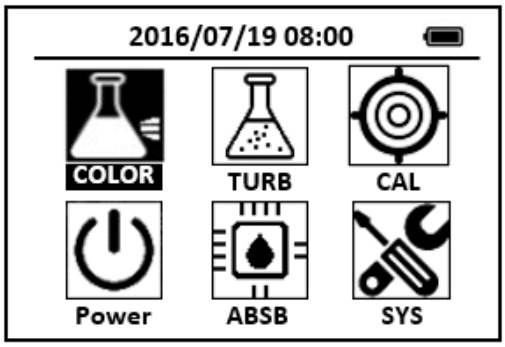

Figure 198

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **FeZi** icon.

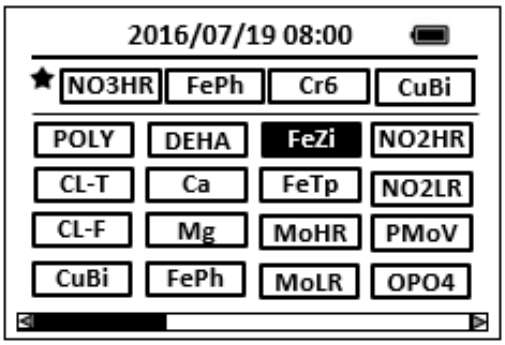

Figure 199

3. Press the OK key to enter **FeZi** test program interface.

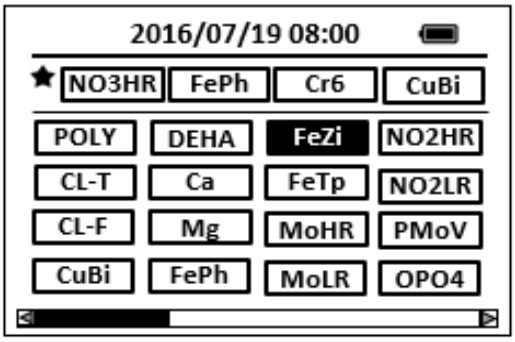

Figure 200

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Fill a sample vial to the 25-ml line with sample.
   Note: Rinse glassware with a 1:1 Hydrochloric Acid Solution and deionized water before use to avoid errors due to iron deposits on the glass.
6. Add the contents of the contents of one FerroZine Iron Reagent Solution Pillow to 25-ml sample vial, Swirl the vial to mix the reagent.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

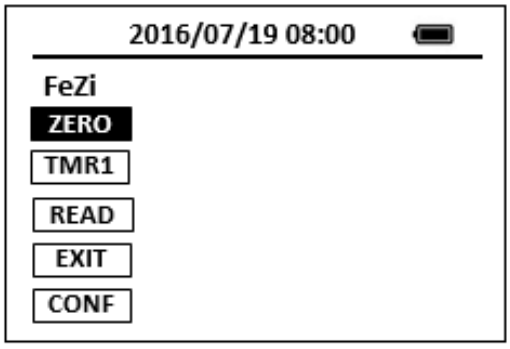

Figure 201

8. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
   Note: A violet color will develop if iron is present.

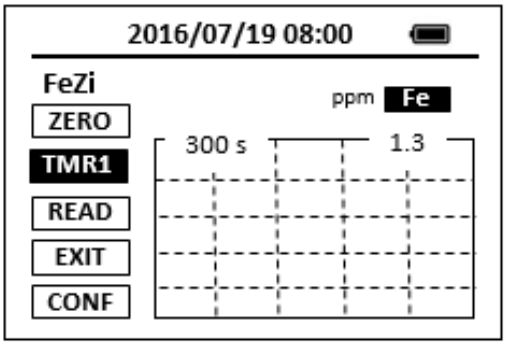

Figure 202

9. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
10. Pour 10-ml solution from the 25ml sample vial ((the prepared sample).
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Place the prepared blank into the Pyxis SP-800 sample vial compartment. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. A new concentration value based on the last absorbance value measured will be calculated and displayed.

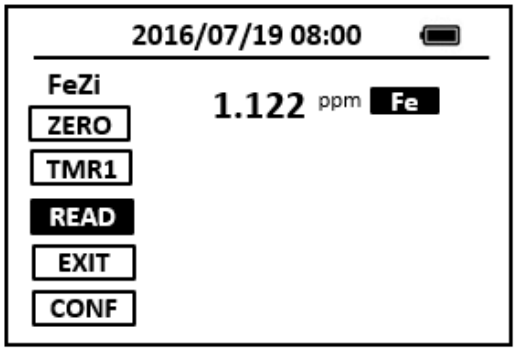

Figure 203

15. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8147

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

38. Hydrogen peroxide-H2O2

Test Program

Description： SP-800 Hydrogen peroxide Method (0.02-500 ppm H2O2) (Iodimetry Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis H2O2 Reagent (PN: 31079)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

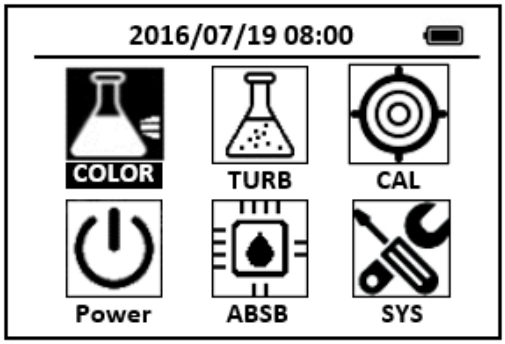

Figure 204

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **H2O2** icon.

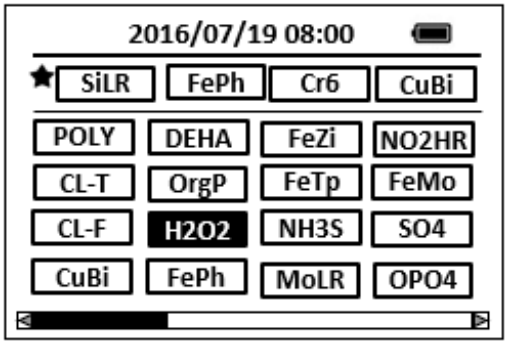

Figure 205

3. Press the OK key to enter **H2O2** test program interface.

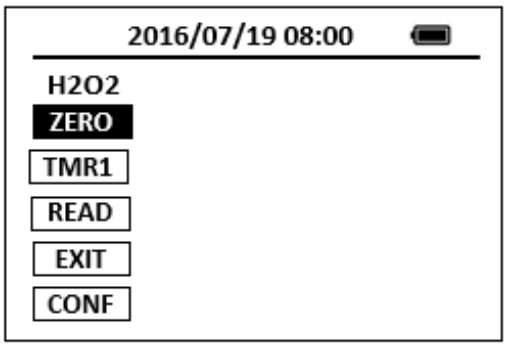

Figure 206

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

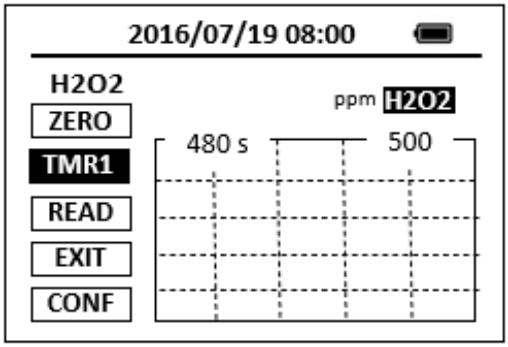

Figure 207

6. Take the sample vial out and add the contents of one H2O2 regent to the sample vial. Swirl the vial to mix the reagent.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 480-second reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

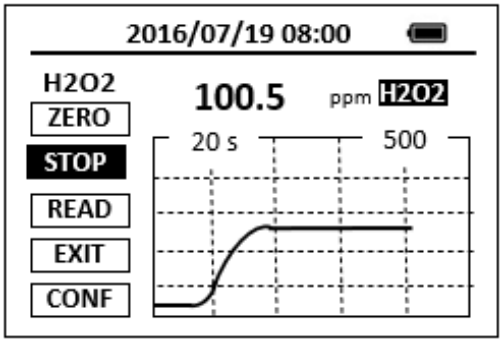

Figure 208

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

39. Hydrogen peroxide, Low Range - H2O2L

Test Program

Description： SP-800 Hydrogen peroxide Low Range Method (0.05-1.5 ppm H2O2) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis H2O2L Reagent (PN: 31124)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display eight major feature groups.

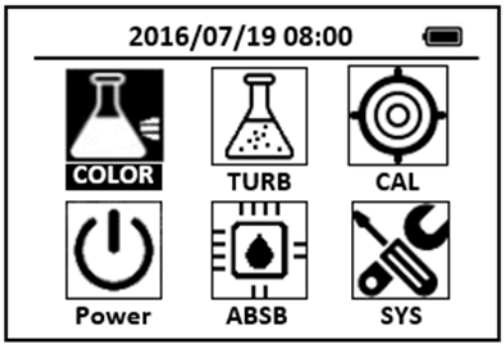

Figure 209

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **H2O2L** icon.

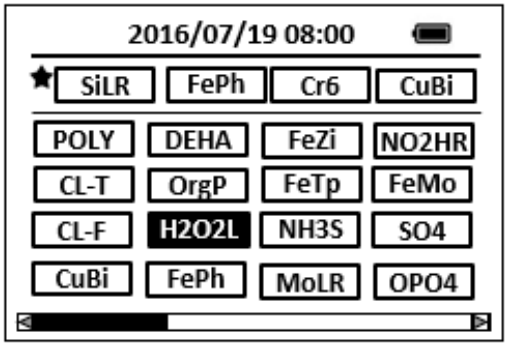

Figure 210

3. Press the OK key to enter **H2O2L** test program interface.

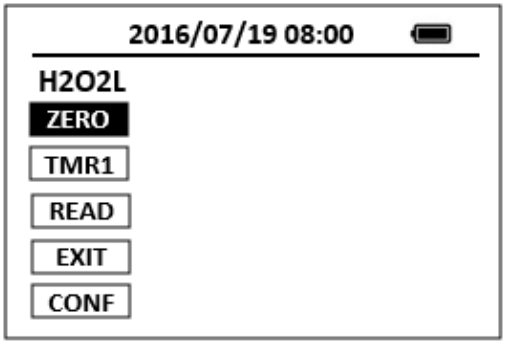

Figure 211

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

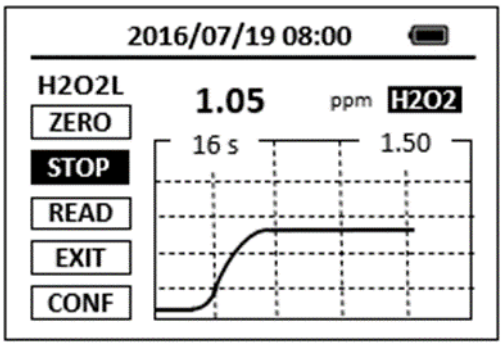

Figure 212

6. Take the sample vial out and add one drop of H2O2L-1 regent to the sample vial. Swirl the vial to mix the reagent.
7. Add the contents of one H2O2L-2 reagent to the sample vial. Swirl the vial to mix the reagent.
8. Place sample vial back into the sample vial compartment and press the **TMR1** key to start the method timer, a 60-second reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

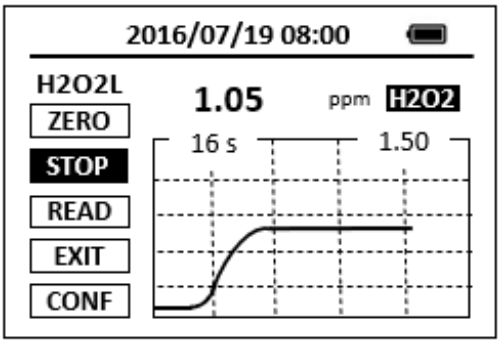

Figure 213

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

40. Magnesium - Mg

Test Program

Description：SP-800 Magnesium Method (0.13-4.00 ppm Mg as CaCO3) (Calmagite Colorimetric Method)

Instruments and Reagents:

5. SP-800 Portable Water Analyzer
6. 10-ml Sample Vial
7. 100-ml graduated mixing cylinder
4. HACH Hardness Reagent Set (Cat. No. 23199-00)
   Includes:
   (3) Alkali Solution for Calcium and Magnesium Test (Cat. No. 22417-32)
   (4) Calcium and Magnesium Indicator Solution (Cat. No. 22418-32)
   (5) EDTA Solution (Cat. No. 22419-26)
   (6) EGTA (Cat. No. 22297-26)

Program:

3. Press OK Key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

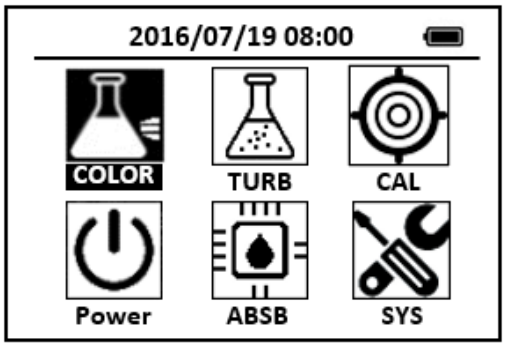

Figure 214

4. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **Mg** icon.

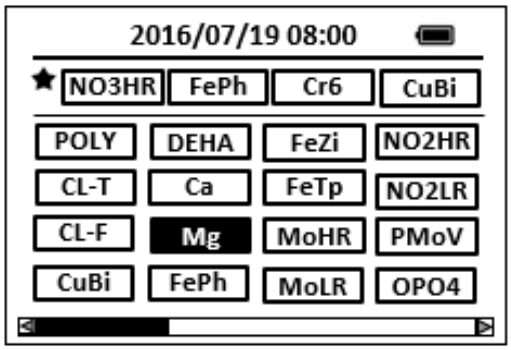

Figure 215

5. Press the OK Key to enter **Mg** test program interface.

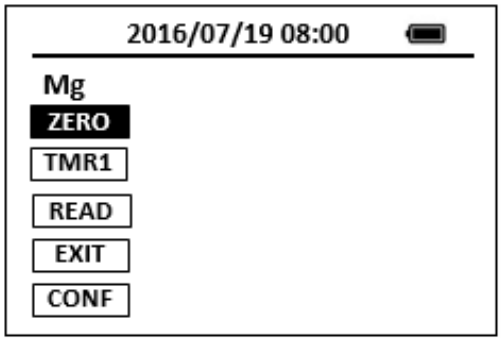

Figure 216

6. Pour 100 ml of sample into a 100-ml graduated mixing cylinder.
   Note: The sample temperature should be 21-29 °C (70-84 °F).
7. Add 1.0 ml of Calcium and Magnesium Indicator Solution using a 1.0-mlmeasuring dropper. Stopper. Invert several times to mix.
8. Add 1.0 ml of Alkali Solution for Calcium and Magnesium Test using a 1.0-ml measuring dropper. Stopper. Invert several times to mix.
   Note: If the sample turns read after adding Alkali Solution, dilute sample 1:1 and repeat analysis.
9. Pour 10 ml of the solution into each of two sample vials.
   Note: The test will detect any calcium or magnesium contamination in the mixing cylinder, measuring droppers or sample vials. To test cleanliness, repeat the test multiple times until you obtain consistent results.
10. Add one drop of EDTA solution to one vial (the blank sample). Swirl the vial to mix the reagent.
11. Add one drop of EGTA solution to another vial (the prepared sample). Swirl the vial to mix the reagent.
12. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** Key to zero the instrument. Pyxis SP-800 will display the page.

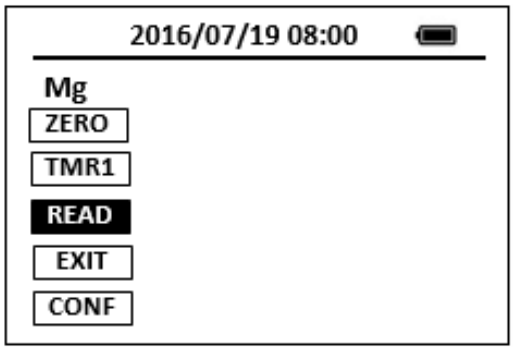

Figure 217

13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** Key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed.

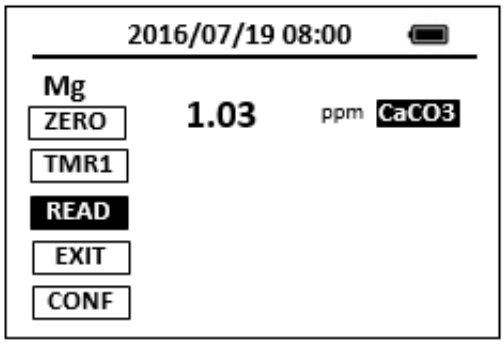

Figure 218

15. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8030

Notes:

5. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
6. *Rinse all glassware with 1:1 Hydrochloric Acid Solution. Rinse again with deionized water.*
7. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
8. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK Key for 3 seconds*

will wake up the instrument, and return to the original page if it has any measurement data.

41. Manganese, High Range - MnHR

Test Program

Description：SP-800 Manganese High Range Method (0.2-20.0 ppm Mn) (Periodate Oxidation Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH High Range Manganese Reagent Set (Cat. No. 24300-00)
   Includes:
   (1) Buffer Powder Pillows, citrate type for Manganese (Cat. No. 21076-69)
   (2) Sodium Periodate Powder Pillows for Manganese (Cat. No. 21077-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

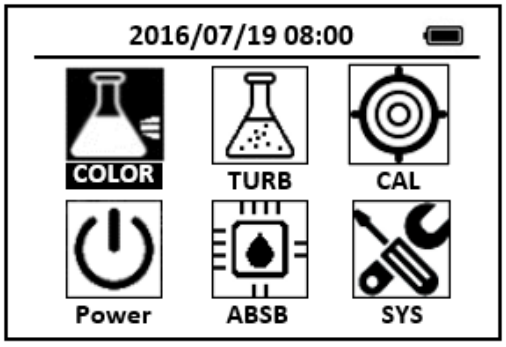

Figure 219

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **MnHR** icon.

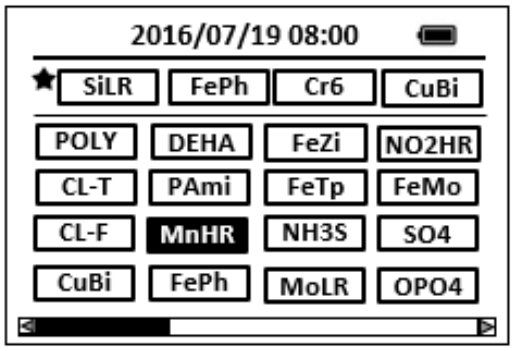

Figure 220

3. Press the OK key to enter **MnHR** test program interface.

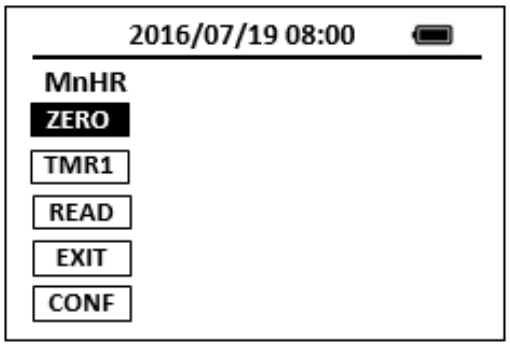

Figure 221

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Adjust the pH to 4 to 5 with 5.0 N sodium hydroxide before analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

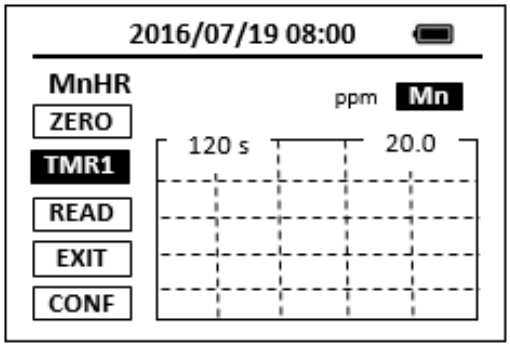

Figure 222

7. Take the sample vial out, Add the contents of one Buffer Powder Pillow to the sample vial, Swirl the vial to mix the reagent.
8. Add the contents of one Sodium Periodate Powder Pillow to the sample vial, Swirl the vial for 10 seconds to mix the reagent.

9. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
   Note: A violet color will form if manganese is present.
10. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
11. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

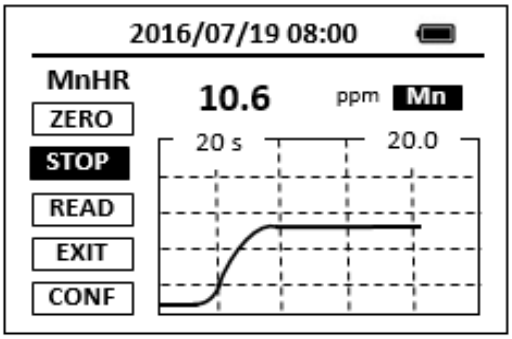

Figure 223

12. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8034

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

42. Manganese, Low Range - MnLR

Test Program

Description：SP-800 Manganese Low Range Method (0.02-0.70 ppm Mn) (PAN Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Manganese Reagent Set (Cat. No. 26517-00)
   Includes:
   (1) Alkaline-Cyanide Reagent (Cat. No. 21223-26)
   (2) Ascorbic Acid Powder Pillows (Cat. No. 14577-99)
   (3) PAN Indicator Solution, 0.1% (Cat. No. 21224-26)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

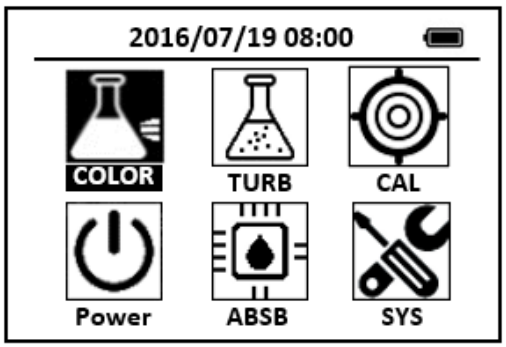

Figure 224

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **MnLR** icon.

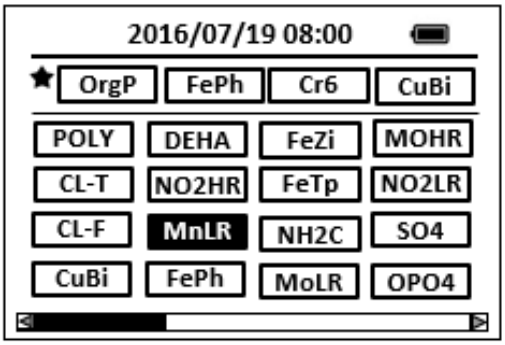

Figure 225

3. Press the OK key to enter **MnLR** test program interface.

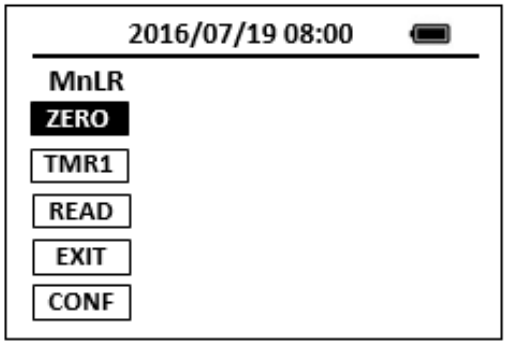

Figure 226

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
   Note: Rinse all glassware with 1:1 Nitric Acid Solution. Rinse again with deionized water
5. Fill another sample vial with 10 ml of sample (the prepared sample).
6. Add the contents of one Ascorbic Acid Powder Pillow to each sample vial. Cap the vials and invert to mix.
7. Add 12 drops of Alkaline-Cyanide Reagent Solution to each vial. Swirl to mix.
   Note: A cloudy solution may form in some samples after reagent addition. The turbidity should dissipate after Step 13.
   Note: A pipet may be used to dispense 0.4 ml of the Alkaline Cyanide Reagent.
8. Add 12 drops of PAN Indicator Solution,0.1%, to each vial. Swirl to mix.
   Note: An orange color will develop in the sample if manganese is present.
   Note: A pipet may be used to dispense 0.4 ml of the PAN Indicator Solution.
9. Press the **ZERO** key. Pyxis SP-800 will display the page.

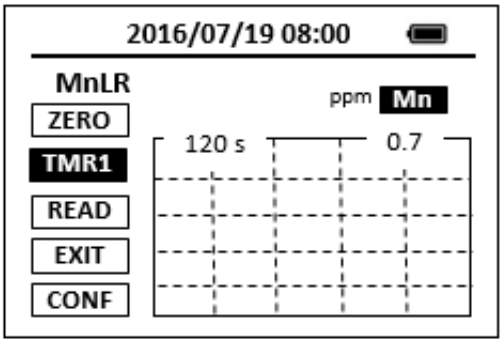

Figure 227

10. Press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
11. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. Concentration value based on the last absorbance value measured will be calculated and displayed.

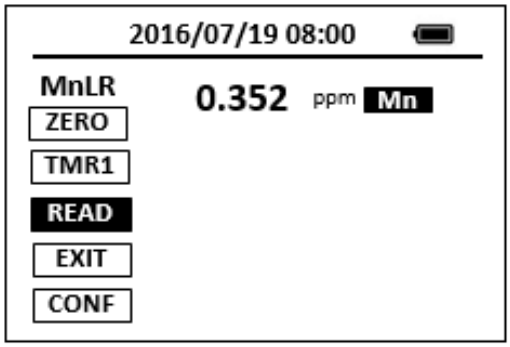

Figure 228

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8149

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized*

water.

3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

43. Molybdenum, Molybdate,High Range - MoHR

Test Program

Description：SP-800 Molybdenum, Molybdate, High Range Method (0.2-40.0 ppm Mo6)

(Mercaptoacetic Acid Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Molybdenum Reagent Set (Cat. No. 26041-00)
   Includes:
   (1) MolyVer 1 Reagent Powder Pillows (Cat. No. 26042-99)
   (2) MolyVer 2 Reagent Powder Pillows (Cat. No. 26043-99)
   (3) MolyVer 3 Reagent Powder Pillows (Cat. No. 26044-99)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

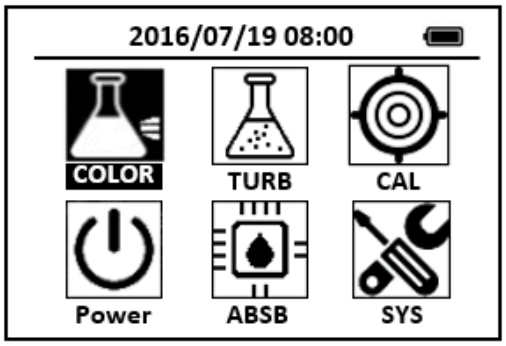

Figure 229

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **MoHR** icon.

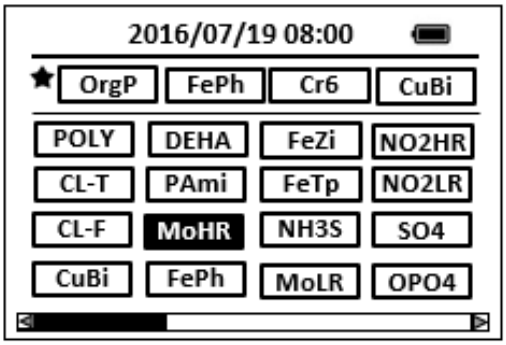

Figure 230

3. Press the OK key to enter **MoHR** test program interface.

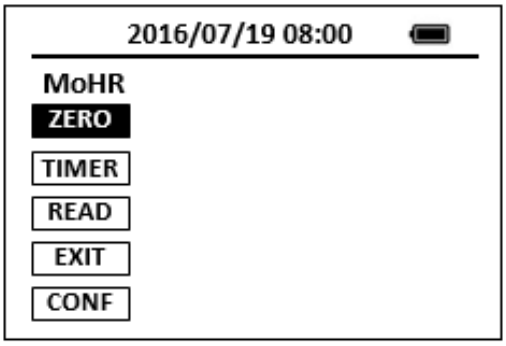

Figure 231

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Filter turbid samples.
   Note: Adjust pH of stored samples before analysis.
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
7. Add the contents of one MolyVer 1 Reagent Powder Pillow to the sample vial, Swirl the vial to mix the reagent.
8. Add the contents of one MolyVer 2 Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
9. Add the contents of one MolyVer 3 Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: Accuracy is not affected by undissolved powder.
10. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
    Note: Molybdenum will cause a yellow color to form.

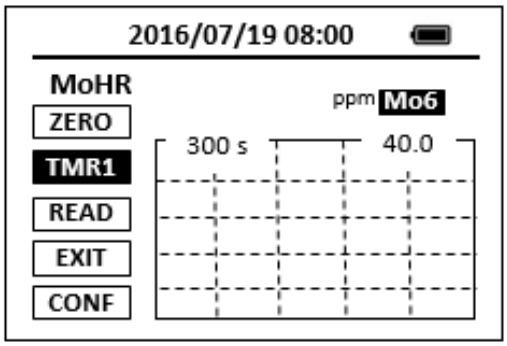

Figure 232

11. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
12. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

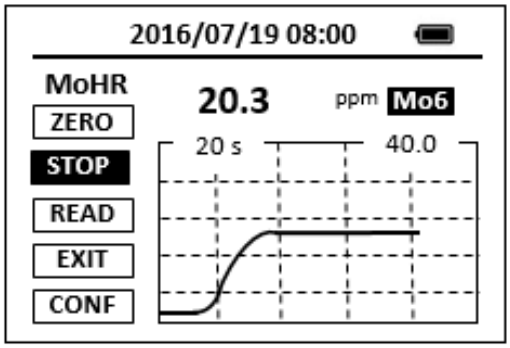

Figure 233

13. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8036

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock*

position of the sample vial compartment or any position consistently.

4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

44. Molybdenum, Molybdate, Low Range - MoLR

Test Program

Description： SP-800 Molybdenum, Molybdate, Low Range Method (0.07-3.00 ppm Mo6)

(Ternary Complex Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml mixing graduated cylinder
4. HACH Molybdenum Reagent Set, 20 mL sample (Cat. No. 24494-00)
   Includes:
   (1) Molybdenum 1 Reagent for 20 mL sample size (Cat. No. 23524-49)
   (2) Molybdenum 2 Reagent Solution (Cat. No. 23525-12)

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

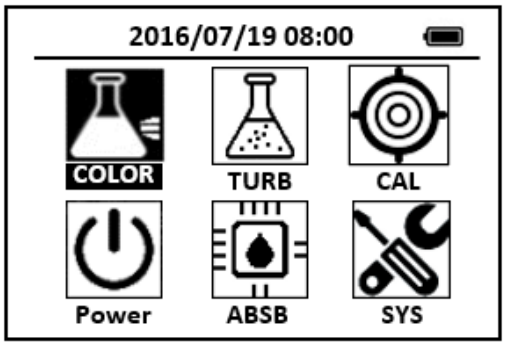

Figure 234

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **MoLR** icon.

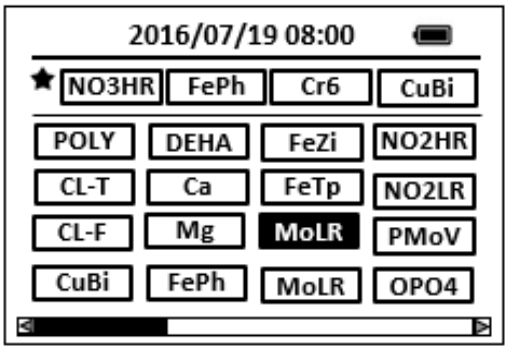

Figure 235

3. Press the OK key to enter **MoLR** test program interface.

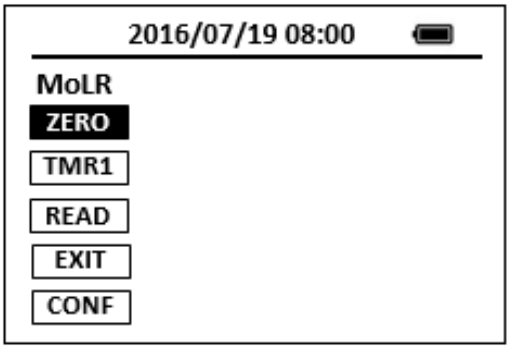

Figure 236

Note: Filter turbid samples.

4. Fill a 25-ml mixing graduated cylinder with 20 ml of the sample.
5. Add the contents of Molybdenum 1 Reagent Powder Pillow to 25-ml mixing graduated cylinder. stopper. Invert the graduated cylinder several times to dissolve the reagents.
6. Pour 10 mL of the solution into a 10-ml sample cell.
7. Add 0.5 mL of Molybdenum 2 Reagent to the sample cell. Swirl to mix. This is the prepared sample.

   Note: Molybdenum will cause a green color to form.
8. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

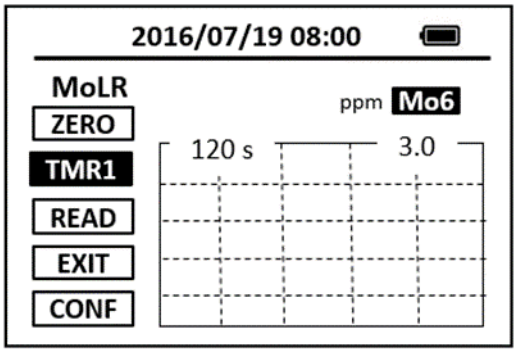

Figure 237

9. Press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the **OK** key to the icon menu-assisted.
11. Fill a second sample cell with 10 mL of solution from the graduated cylinder (the blank).
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. A new concentration value based on the last absorbance value measured will be calculated and displayed.

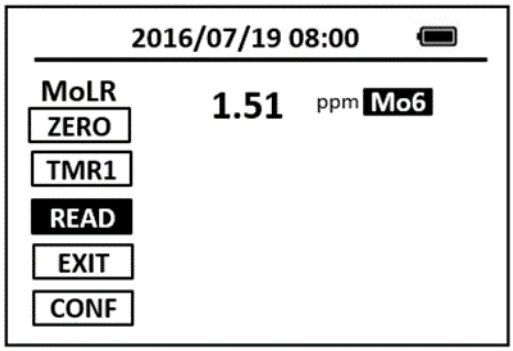

Figure 238

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8169

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

45. Hydrazine - N2H4

Test Program

Description：SP-800 Hydrazine Method (0.016-0.5 ppm N2H4) (p-Dimethylaminobenzaldehyde Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH HydraVer 2 Hydrazine Reagent

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

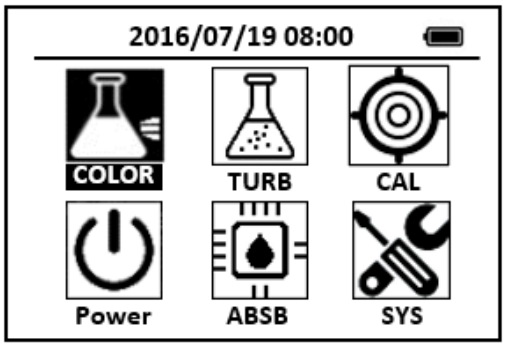

Figure 239

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **N2H4** icon.

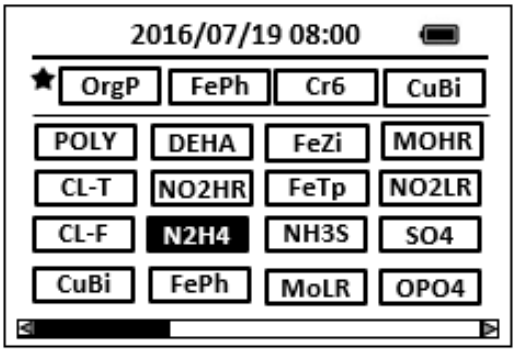

Figure 240

3. Press the OK key to enter **N2H4** test program interface.

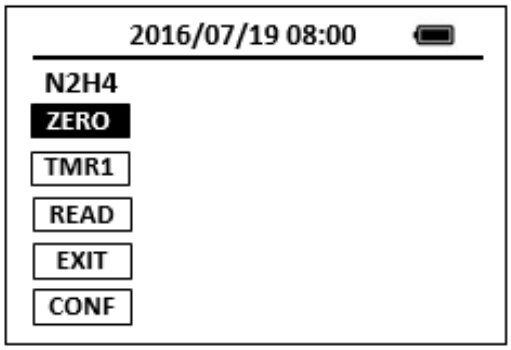

Figure 241

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
6. Add 0.5 ml of HydraVer 2 Hydrazine Reagent to each sample vial. Cap the vials and invert to mix.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

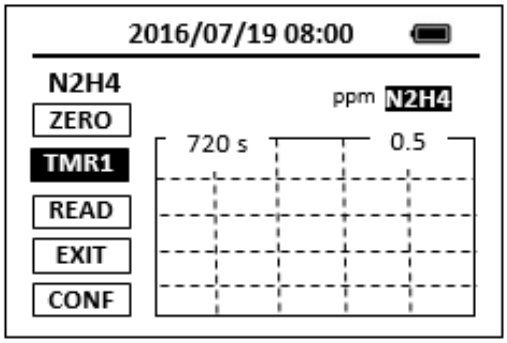

Figure 242

8. Press the **TMR1** key to start the method timer, a 12-minute reaction period will begin.

   Note: Complete Steps 10-13 within 3 minutes.

   Note: A yellow color will form if hydrazine is present. The blank will be a faint yellow color due to the N2H4 reagent.
9. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
10. Use a soft cloth or lint free paper tissue to clean the sample vial.
11. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.

13. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

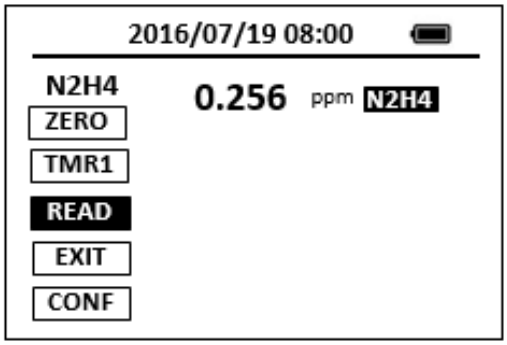

Figure 243

14. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8141

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

46. Chloramine, Mono, Low Range - NH2C

Test Program

Description： SP-800 Chloramine, Mono, Low Range Method (0.1-3.0 ppm CL2) (Indophenol Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Monochlor F Reagent Pillows (Cat. No. 28022-46)

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

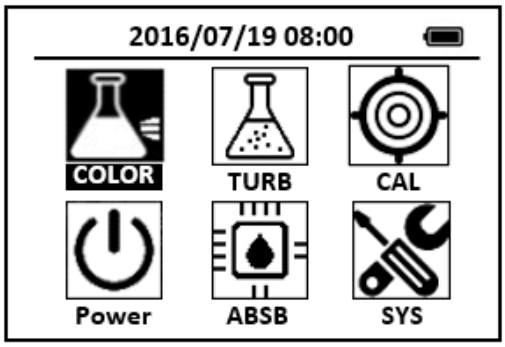

Figure 244

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NH2C** icon.

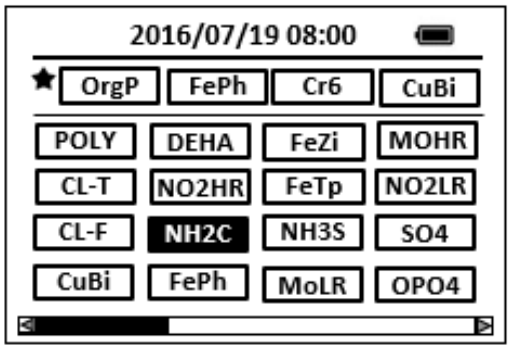

Figure 245

3. Press the OK key to enter **NH2C** test program interface.

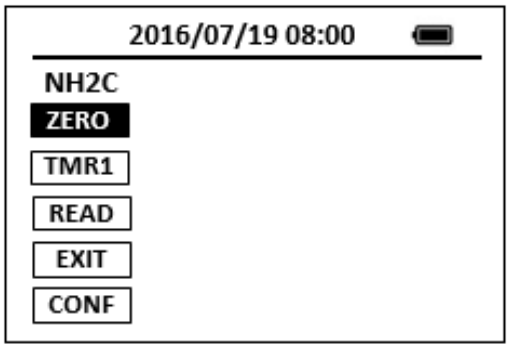

Figure 246

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: For the most accurate results, determine reagent blank for each new lot of reagent by running the test using deionized water instead of sample.
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
6. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key. Pyxis SP-800 will display the page.

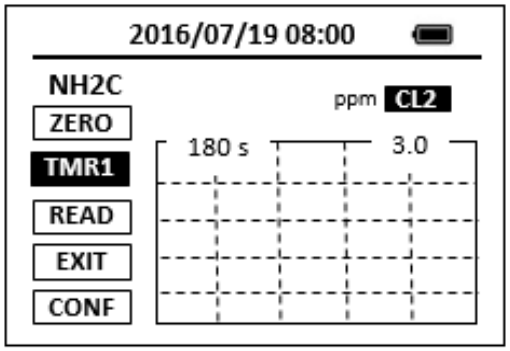

Figure 247

7. Add the contents of one pillow of Monochlor–F to the sample vial, Swirl the vial about 20 seconds to dissolve.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
   Note: The color development time depends on the sample temperature.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

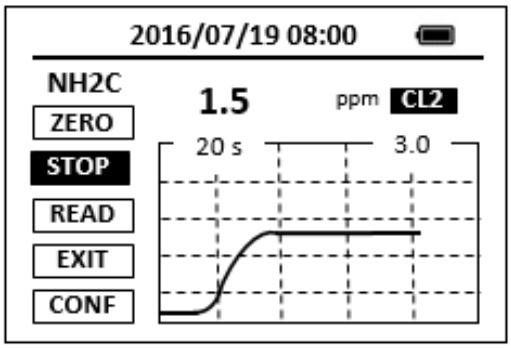

Figure 248

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 10171

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

47. Nitrogen, Total (Test 'N Tube Method) - N-TLR

Test Program

Description： SP-800 Total Nitrogen Low Range Method (2.0-25.0 ppm N) (Test 'N Tube Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. COD/TNT adapter
4. HACH Test 'N Tube Total Nitrogen Reagent Set (Cat. No. 26722-45)
   Includes:
   (1) TN Reagent C Vials, Acid Solution*(Cat. No. 26721-45)
   (2) TN Hydroxide Reagent Sample Digestion Vials*(Cat. No. 26717-45)
   (3) TN Persulfate Reagent Powder Pillows (Cat. No. 26718-49)
   (4) TN Reagent A, Bisulfite Powder Pillows (Cat. No. 26719-49)
   (5) TN Reagent B, Indicator Powder Pillows (Cat. No. 26720-49)

Program:

1. Turn on the RD-800 Reactor. Preheat to 105 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
2. Using a funnel, add the contents of one Total Nitrogen Persulfate Reagent Powder Pillow to each of two Total Nitrogen Hydroxide Reagent vials.
   Note: Wipe off any reagent that may get on the lid or the tube threads.
   Note: One reagent blank is sufficient for each set of samples.
3. Add 2 ml of sample to one vial. Add 2 ml of organic-free water to another vial (the reagent blank). Cap both vials and shake vigorously (about 30 seconds). Place the vials in the Reactor. Heat for 30 minutes.
   Note: The reagent may not dissolve completely after shaking.
   Note: Alternate water must be free of all nitrogen containing species.
4. Using finger cots or gloves, remove the hot vials from the reactor and allow to cool to room temperature.
   Note: It is very important to remove the vials from the Reactor after exactly 30 minutes.
5. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

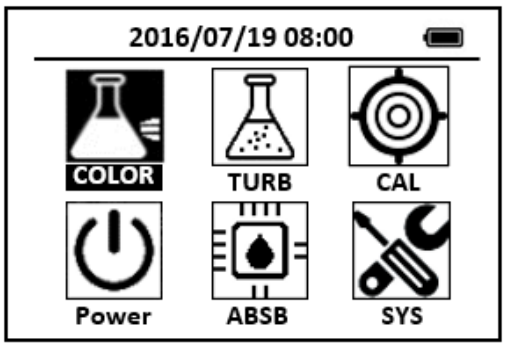

Figure 249

6. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **N-TLR** icon.

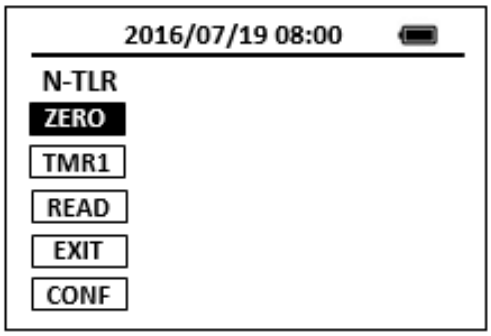

Figure 250

7. Remove the caps from the digested vials and add the contents of one TN Reagent A Powder Pillow to each vial. Cap the vials and shake for 15 seconds.
8. Insert the COD/TNT adapter into the vial holder by rotating the adapter until it drops into place. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band
9. Press the **ZERO** key. Pyxis SP-800 will display the page.

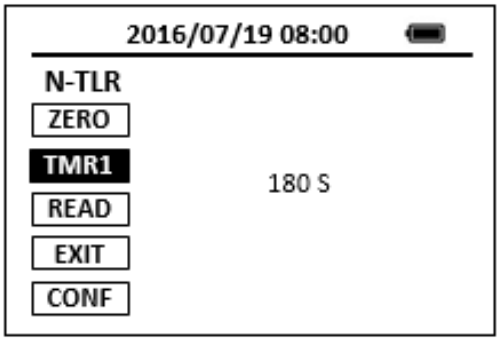

Figure 251

10. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.

11. When the timer reaches the preset time and the reaction is complete, after the timer beeps, Pyxis SP-800 will display the page.

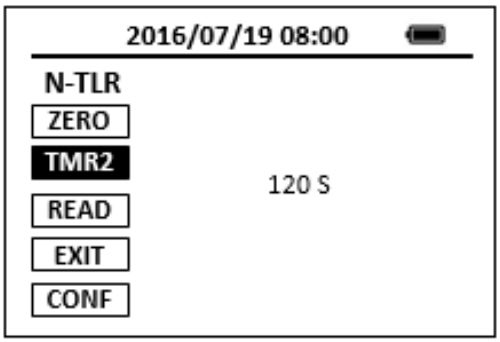

Figure 252

12. Remove the caps and add one TN Reagent B Powder Pillow to each vial. Cap the vials and shake for 15 seconds.
13. Press the **TMR2** key to start the method timer, a 2-minute reaction period will begin.
    Note: The reagent will not completely dissolve. The solution will begin to turn yellow.
14. After the timer beeps, take out two TN Reagent C Vials, remove the caps.
15. Add 2 ml of digested, treated sample to one vial (TN Reagent C Vial) as the prepared sample. add 2 ml of the digested, treated reagent blank to the second vial (TN Reagent C Vial) as the blank sample.
16. Cap and invert 10 times to mix. Use slow, deliberate inversions for complete recovery. The vials will be warm.
    Note: Follow these instructions for inversion or low results may occur. Hold the vial vertical with the cap up. Invert the vial and wait for all of the solution to flow to the cap end. Pause. Return the vial to the upright position and wait for all of the solution to flow to the vial bottom. This is one inversion (10 inversions = 30 seconds)
17. Press the **TMR3** key to start the method timer, a 5-minute reaction period will begin.

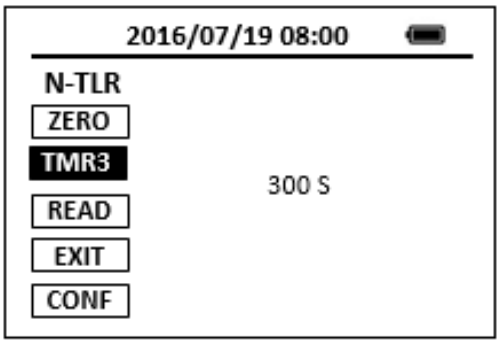

Figure 253

18. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
19. Use a soft cloth or lint free paper tissue to clean the sample vial.
    Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks.
20. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.
21. Repeat step 5, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
22. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
23. Concentration value based on the last absorbance value measured will be calculated and displayed.

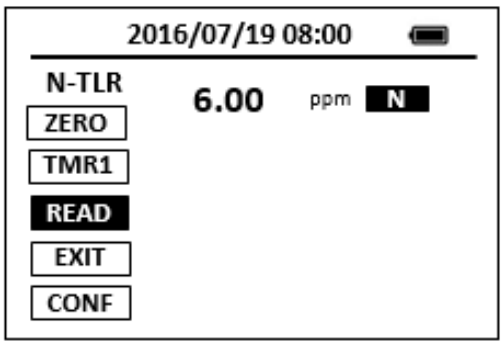

Figure 254

24. Press **EXIT** key to return to the main page.

The method is compatible with HACH 10071

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds*

will wake up the instrument, and return to the original page if it has any measurement data.

48. Nitrogen, Total (Test ‘N Tube Method) - N-THR

Test Program

Description： SP-800 Total Nitrogen High Range Method (7-150 ppm N) (Test ‘N Tube Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. COD/TNT adapter
4. Test ’N Tube HR Total Nitrogen Reagent Set (Cat. No. 27141-00)
   Includes:
   (1) HR Total Nitrogen Hydroxide Digestion Vials (Cat. No. *)
   (2) Total Nitrogen Persulfate Reagent Powder Pillows (Cat. No. 26718-46)
   (3) Total Nitrogen Reagent A, Bisulfite Powder Pillows (Cat. No. 26719-46)
   (4) Total Nitrogen Reagent B, Indicator Powder Pillows (Cat. No. 26720-46)
   (5) Total Nitrogen Reagent C Vials, Acid Solution (Cat. No. *)

Program:

1. Turn on the RD-800 Reactor. Preheat to 105 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
2. Using a funnel, add the contents of one Total Nitrogen Persulfate Reagent Powder Pillow to one HR Total Nitrogen Hydroxide Digestion vial.
   Note: Wipe off any reagent that may get on the lid or the tube threads.
3. Add 0.5 ml of organic-free water to the vial (the reagent blank). Cap the vial and shake vigorously for about 30 seconds.
4. Using a funnel, add the contents of one Total Nitrogen Persulfate Reagent Powder Pillow to another HR Total Nitrogen Hydroxide Digestion vial.
5. Add 0.5 ml of sample to one vial. Cap the vial and shake vigorously about 30 seconds.
   Note: The reagent may not dissolve completely after shaking.
   Note: Alternate water must be free of all nitrogen containing species.
   Note: One reagent blank is sufficient for each set of samples.
6. Place the vials in the reactor. Heat for 30 minutes.
7. Using finger cots or gloves, remove the hot vials from the reactor and allow to cool to room temperature.
   Note: It is very important to remove the vials from the Reactor after exactly 30 minutes.

8. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

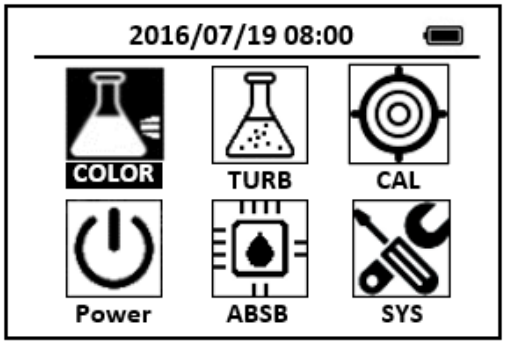

Figure 255

9. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **N-THR** icon.

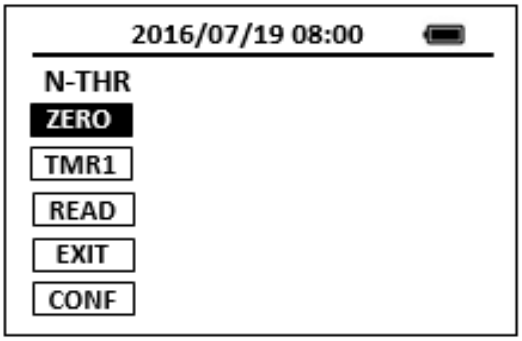

Figure 256

10. Remove the caps from the digested vials and add the contents of one Total Nitrogen Reagent A Powder Pillow to each vial. Cap the vials and shake for 15 seconds.
11. Insert the COD/TNT adapter into the vial holder by rotating the adapter until it drops into place. Then push down to fully insert it.
    Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band
12. Press the **ZERO** key. Pyxis SP-800 will display the page.

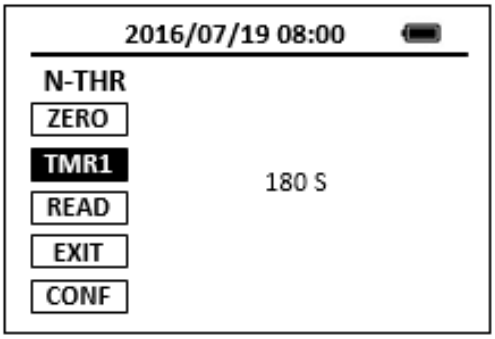

Figure 257

13. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
14. When the timer reaches the preset time and the reaction is complete, Pyxis SP-800 will display the page.

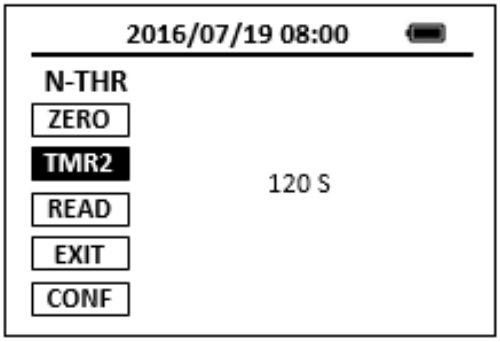

Figure 258

15. After the timer beeps, remove the caps and add one Total Nitrogen Reagent B Powder Pillow to each vial. Cap the vials and shake for 15 seconds.
16. Press the **TMR2** key to start the method timer, a 2-minute reaction period will begin.
17. After the timer beeps, take out two Total Nitrogen Reagent C vials, remove the caps. Add 2 ml of digested, treated sample to one vial (Total Nitrogen Reagent C vial) as the prepared sample. Add 2 ml of the digested, treated reagent blank to the second vial (Total Nitrogen Reagent C vial) as the blank sample. The vial will be warm.
18. Cap and invert 10 times to mix. The vials will be warm.
    Note: Proper mixing is important for complete recovery. Hold the vial vertical with the cap up. Invert the vial and wait for all of the solution to flow to the cap end. Pause. Return the vial to the upright position and wait for all of the solution to flow to the vial bottom. This is one inversion (10 inversions = 30 seconds).
19. Press the **TMR3** key to start the method timer, a 5-minute reaction period will begin.

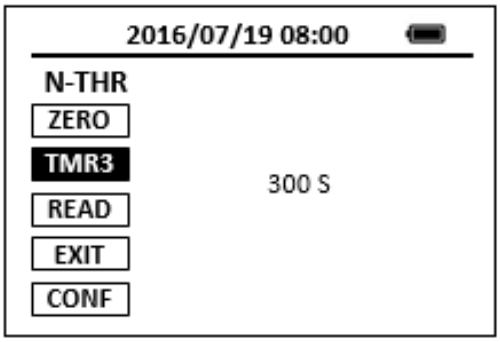

Figure 259

20. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
    Note: The yellow color will intensify.
21. Use a soft cloth or lint free paper tissue to clean the sample vial.
22. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.
23. Repeat step 9, place the Total Nitrogen Reagent C vial containing the reagent blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
24. Place the Total Nitrogen Reagent C vial containing the reagent sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
25. Concentration value based on the last absorbance value measured will be calculated and displayed.

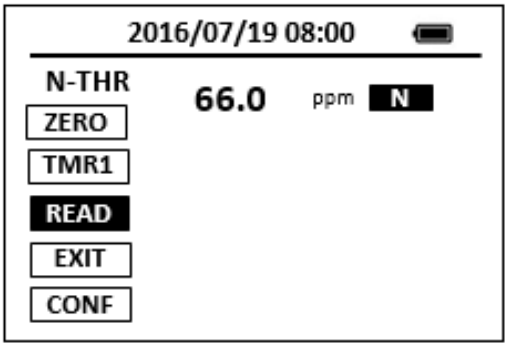

Figure 260

26. Press **EXIT** key to return to the main page.

The method is compatible with HACH 10072

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

49. Nitrogen, Ammonia - NH3S

Test Program

Description：SP-800 Nitrogen, Ammonia Method (0.02-0.5 ppm NH3S-N) (Salicylate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Ammonia Nitrogen Reagent Set for 10-mL samples (Cat. No. 26680-00) Includes:
   (1) Ammonia Cyanurate Reagent Powder Pillows (Cat. No. 26531-99)
   (2) Ammonia Salicylate Reagent Powder Pillows (Cat. No. 26532-99)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

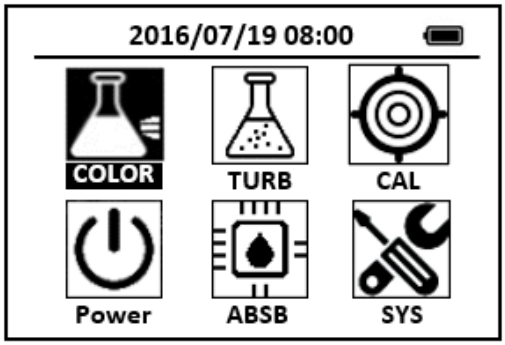

Figure 261

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NH3S** icon.

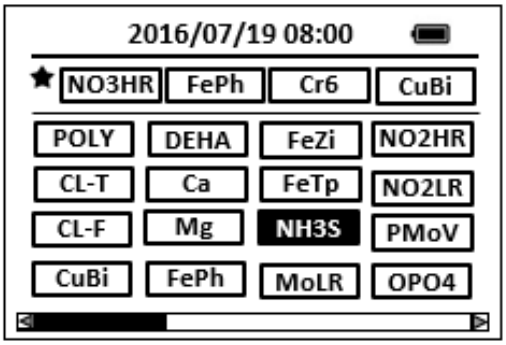

Figure 262

3. Press the OK key to enter **NH3S** test program interface.

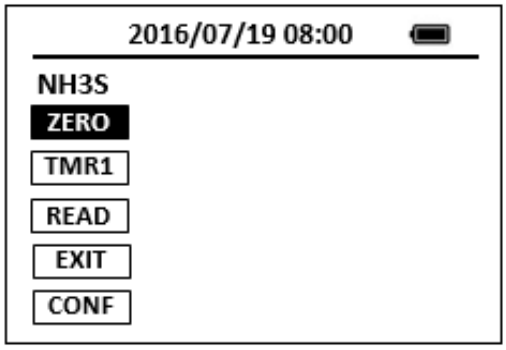

Figure 263

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
6. Add the contents of one Ammonia Salicylate Reagent Powder Pillow to each sample vial. Cap the vials and invert to mix.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

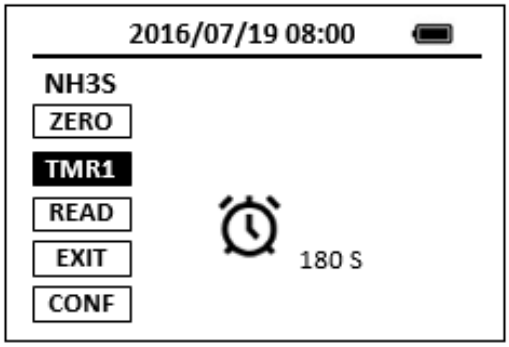

Figure 264

8. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
9. When the timer reaches the preset time and the reaction is complete, the timer beeps. the cursor will automatically switch to **TMR2** key.
10. Add the contents of one Ammonia Cyanurate Reagent Powder Pillow to each sample vial. Cap the vials and shake to dissolve the reagent.
    Note: A green color will develop if ammonia nitrogen is present.
11. Press the **TMR2** key to start the method timer, a 15-minute reaction period will begin.

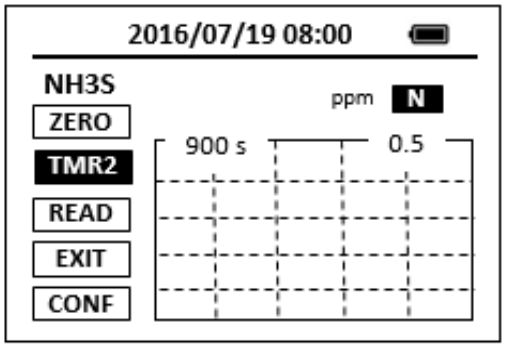

Figure 265

12. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
13. Use a soft cloth or lint free paper tissue to clean the sample vial.
14. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
15. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
16. Concentration value based on the last absorbance value measured will be calculated and displayed.

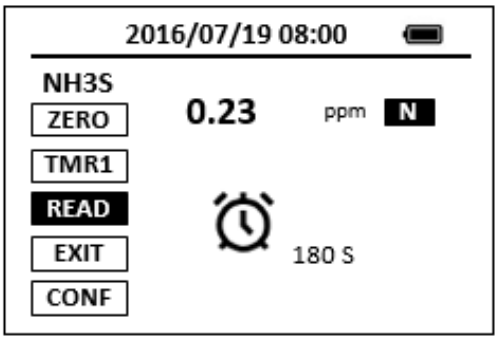

Figure 266

17. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8155

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*

3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

50. Nitrogen, Ammonia (Test ‘N Tube) - NH3LR

Test Program

Description：SP-800 Nitrogen, Ammonia, Low Range Method (0.08–2.50 ppm NH3-N) (Salicylate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. COD/TNT adapter
4. HACH AmVer Reagent Set for Nitrogen, Ammonia, Low Range TNT (Cat. No. 26045-45)
   Includes:
   (1) AmVer Diluent Reagent, Low Range Test ‘N Tube (Cat. No. *)
   (2) Salicylate Reagent Powder Pillows, 5 mL sample (Cat. No. 23952-66)
   (3) Cyanurate Reagent Powder Pillows, 5 mL sample (Cat. No. 23954-66)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

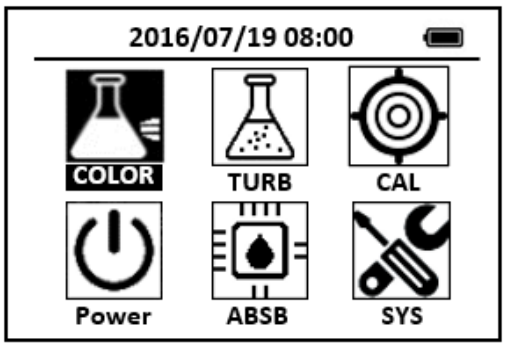

Figure 267

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NH3LR** icon.

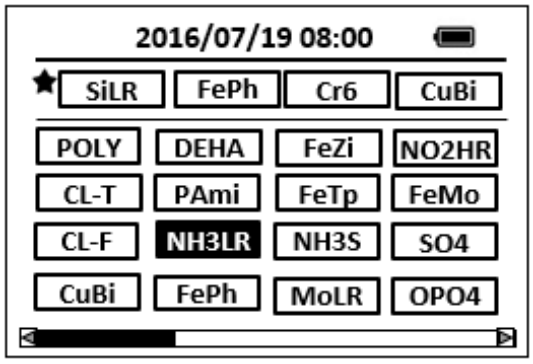

Figure 268

3. Press the OK key to enter **NH3LR** test program interface.

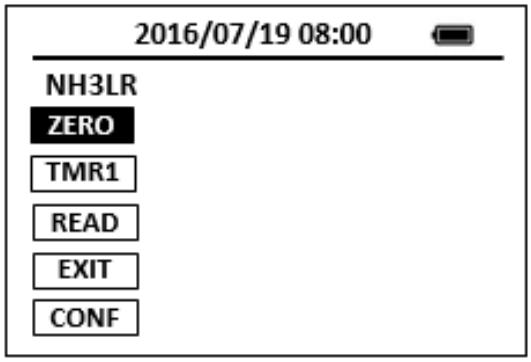

Figure 269

4. Remove the caps from 2 AmVer Diluent Reagent vials. Add 2ml of sample to one vial (the sample). Add 2 ml of deionized water to the other vial (the blank).
5. Using a funnel, add the contents of one Ammonia Salicylate Reagent Powder Pillow for 5 ml sample to each vial.
6. Using a funnel, add the contents of one Ammonia Cyanurate Reagent Powder Pillow for 5 ml sample to each vial.
7. Cap the vials tightly and shake thoroughly to dissolve the powder.
   Note: A green color will develop if ammonia is present.
8. Insert the COD/TNT adapter into the vial holder by rotating the adapter until it drops into place. Then push down to fully insert it.
9. Press the **ZERO** key. Pyxis SP-800 will display the page.

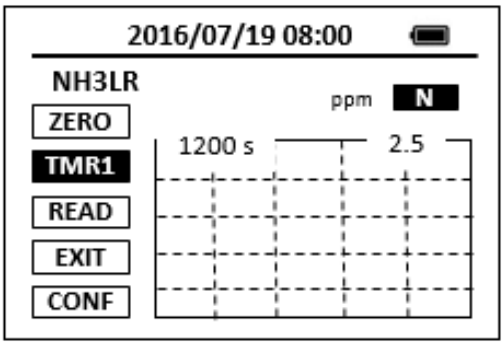

Figure 270

10. Press the **TMR1** key to start the method timer, a 20-minute reaction period will begin.
11. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. A new concentration value based on the last absorbance value measured will be calculated and displayed.

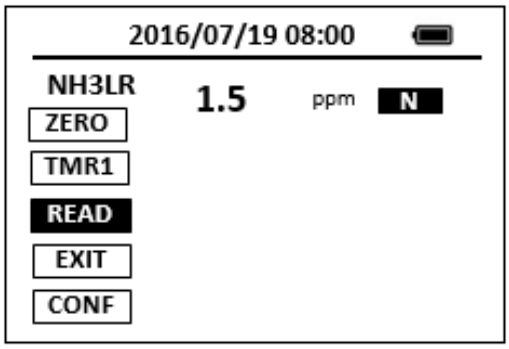

Figure 271

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH10023

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the*

action associated with the selected item.

2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

51. Nitrogen, Ammonia (Test ‘N Tube) - NH3HR

Test Program

Description：SP-800 Nitrogen, Ammonia, High Range Method (1.0-50.0 ppm NH3-N) (Salicylate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. COD/TNT adapter
4. HACH AmVer™ Reagent Set for Nitrogen, Ammonia, High Range, TN (Cat. No. 26069-45)
   Includes:
   (1) AmVer™ HR Reagent Test ‘N Tube™ Vials (Cat. No.*)
   (2) Ammonia Salicylate Reagent Powder Pillows (Cat. No. 23952-66)
   (3) Ammonia Cyanurate Reagent Powder Pillows (Cat. No. 23954-66)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

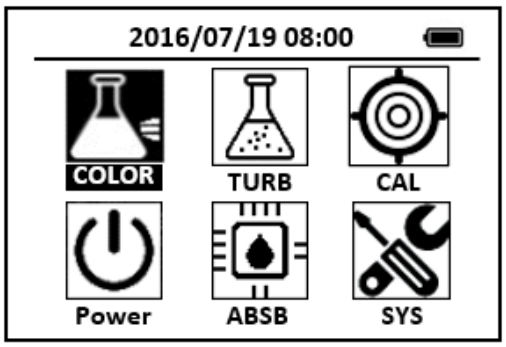

Figure 272

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NH3HR** icon.

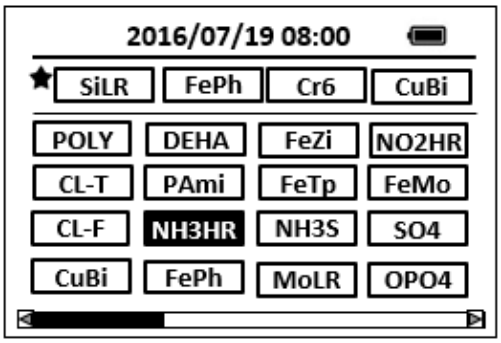

Figure 273

3. Press the OK key to enter **NH3HR** test program interface.

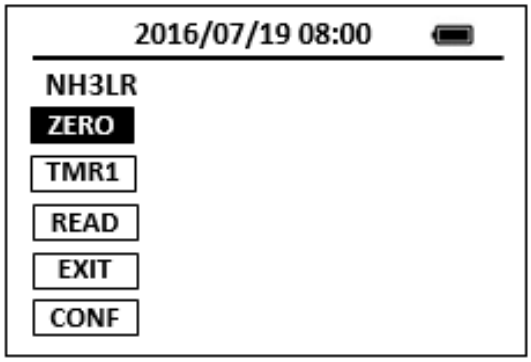

Figure 274

4. Remove the caps from 2 AmVer Diluent Reagent High Range Vials. Add 0.1ml of sample to one vial (the sample). Add 0.1 ml of deionized water to the other vial (the blank).
5. Using a funnel, add the contents of 1 Ammonia Salicylate Reagent Powder Pillow for 5 ml sample to each vial.
6. Using a funnel, add the contents of the contents of 1 Ammonia Cyanurate Reagent Powder Pillow for 5 ml sample to each vial.
7. Cap the vials tightly and shake thoroughly to dissolve the powder.
   Note: A green color will develop if ammonia is present.
8. Insert the COD/TNT adapter into the vial holder by rotating the adapter until it drops into place. Then push down to fully insert it.
9. Press the **ZERO** key. Pyxis SP-800 will display the page.

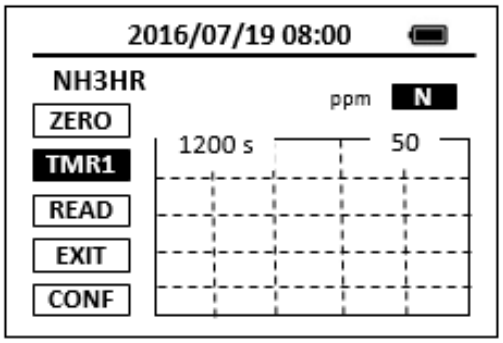

Figure 275

10. Press the **TMR1** key to start the method timer, a 20-minute reaction period will begin.
11. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. A new concentration value based on the last absorbance value measured will be calculated and displayed.

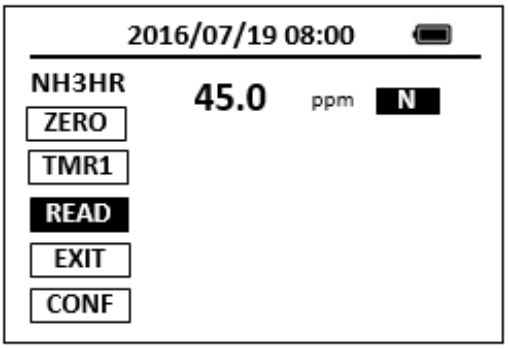

Figure 276

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH10031

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the*

action associated with the selected item.

2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

52. Nickel - Ni

Test Program

Description：SP-800 Nickel Method (0-1.00 ppm Ni) (PAN Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Sample Vial
4. HACH Nickel Reagent Set, 25 mL sample
   Includes:
   (1) EDTA Reagent Powder Pillows (Cat. No. 7005-99)
   (2) Phthalate-Phosphate Reagent Powder Pillows (Cat. No. 21501-66)
   (3) P.A.N. Indicator Solution, 0.3% (Cat. No. 21502-32)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

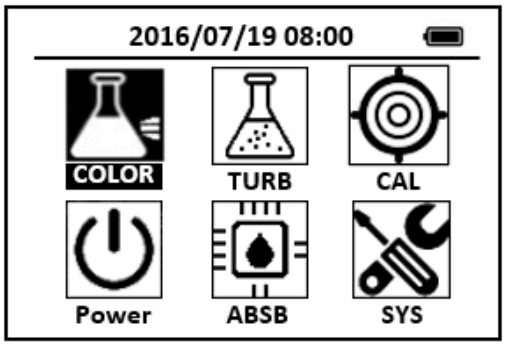

Figure 277

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Ni** icon.

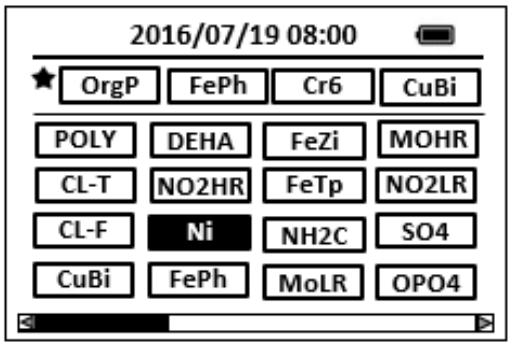

Figure 278

3. Press the OK key to enter Ni test program interface.

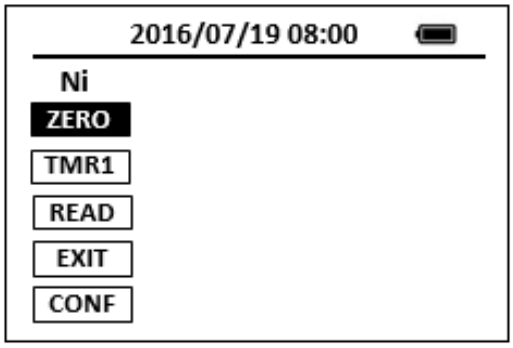

Figure 279

4. Fill a 25 ml sample vial to the 25-ml line with deionized water (the blank sample).
5. Fill a second 25 ml sample vial to the 25-ml line with sample (the prepared sample).
6. Add the contents of one Phthalate-Phosphate Reagent Powder Pillow to each vial, Swirl the vials to mix the reagent.
   Note: If sample contains iron (Fe3+), all the powder must be dissolved completely before continuing with Step 7.
7. Add 1.0 ml of 0.3% PAN Indicator Solution to each vial. Invert several times to mix.
   Note: Use the plastic dropper provided.
8. Press the **ZERO** key. Pyxis SP-800 will display the page.

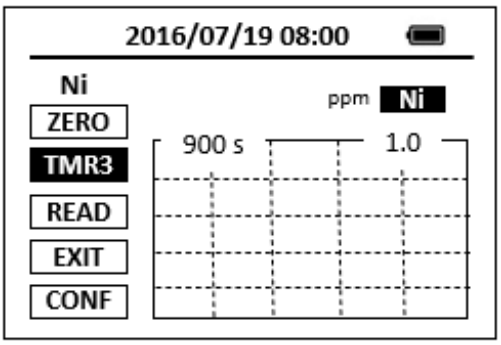

Figure 280

9. Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
   Note: The sample solution color may vary from yellowish-orange to dark red. The blank should be yellow
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, After the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. After the timer beeps, add the contents of one EDTA Reagent Powder Pillow to each vial. Swirl the vials to mix the reagent.
12. Pour 10 ml of solution in the 25-ml blank sample vial into a 10-ml sample vial (the blank sample).
13. Pour out 10 ml of solution in the 25-ml prepared sample vial into a 10-ml sample vial (the prepared sample).
14. Use a soft cloth or lint free paper tissue to clean the sample vial.
15. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
16. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
17. Concentration value based on the last absorbance value measured will be calculated and displayed.

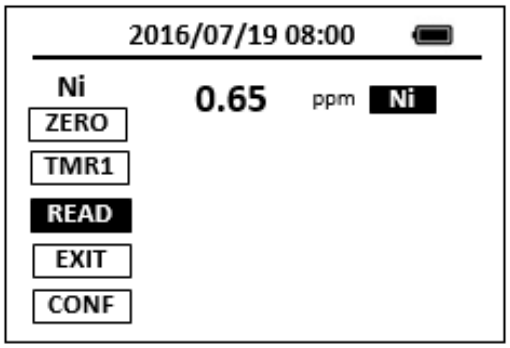

Figure 281

18. Press **EXIT** Key to return to the main page.

The method is compatible with HACH 8150

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

53. Nitrite Direct Read Method - NO2D

Test Program

Description：SP-800 Nitrite Direct Read Method (100-1000 ppm NO2) (Direct Reading Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

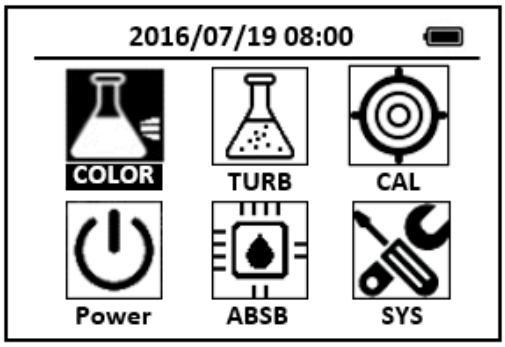

Figure 282

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NO2D** icon.

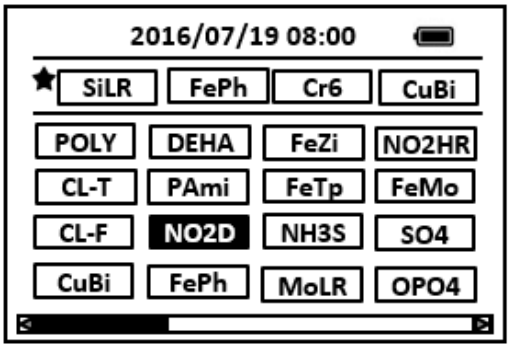

Figure 283

3. Press the OK key to enter **NO2D** test program interface.

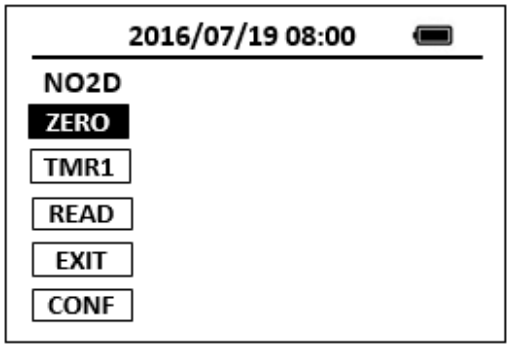

Figure 284

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample). *Note: Analyze samples immediately after collection.*
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

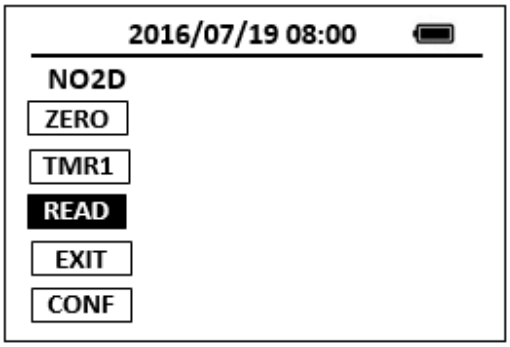

Figure 285

6. Fill a sample vial to the 10-ml line with sample (the prepared sample).
7. Use a soft cloth or lint free paper tissue to clean the sample vial.
8. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
9. Concentration value based on the last absorbance value measured will be calculated and displayed.

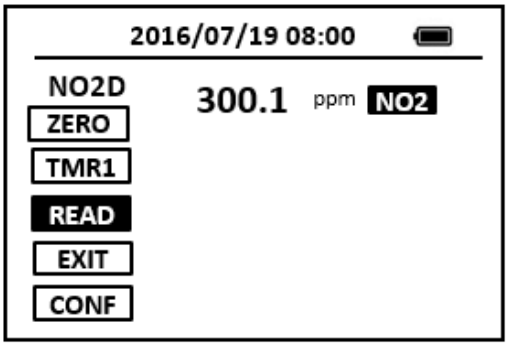

Figure 286

10. Press EXIT key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

54. Nitrite, High Range - NO2HR

Test Program

Description：SP-800 Nitrite High Range Method (2.0-150.0 ppm NO2) (Ferrous Sulfate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH NitriVer 2 Nitrite Reagent Powder Pillows Pyxis (Cat. No. 21075-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

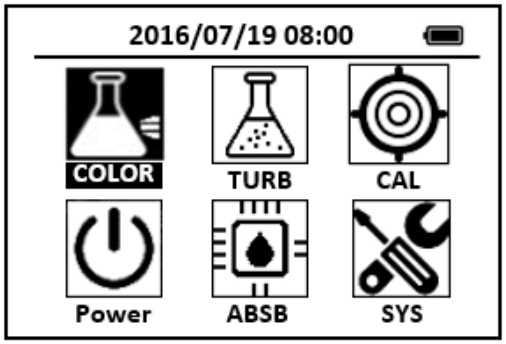

Figure 287

2. Position the cursor to **COLOR** icon by navigation Keys and press the OK Key to enter COLOR selection interface, position the cursor to **NO2HR** icon.

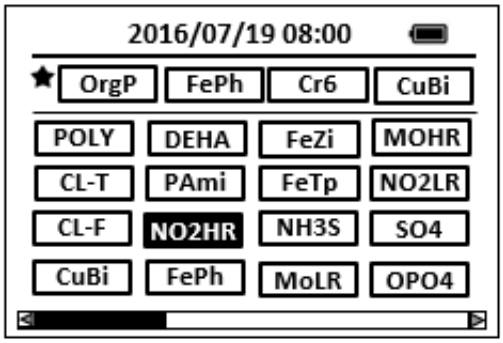

Figure 288

3. Press the OK key to enter **NO2HR** test program interface.

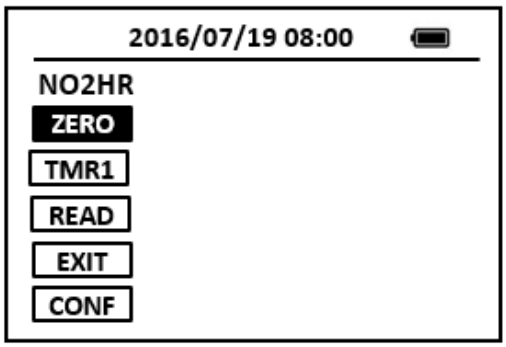

Figure 289

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

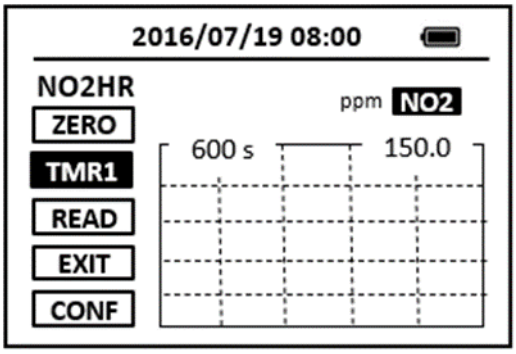

Figure 290

6. Take the sample vial out and add the contents of one NitriVer 2 Nitrite Reagent Powder Pillow to the sample vial. Cap the cell and invert 5-7 times to mix.
   Note: A greenish-brown color will develop if nitrite is present.
   Note: Avoid excessive mixing or low results may occur. Accuracy is not affected by undissolved powder.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 10-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

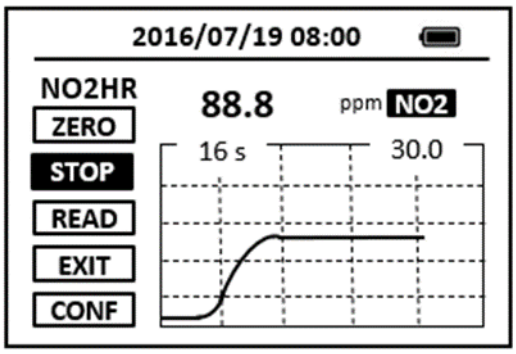

Figure 291

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8153

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

55. Nitrite, Low Range - NO2LR

Test Program

Description：SP-800 Nitrite Low Range Method (0.005-0.350 ppm NO2) (Diazotization Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH NitriVer 3 Nitrite Reagent Powder Pillows (Cat. No. 21071-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

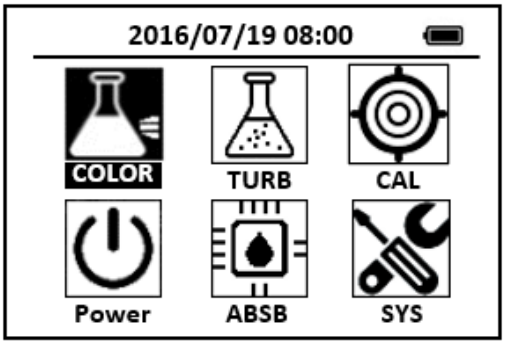

Figure 292

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NO2LR** icon.

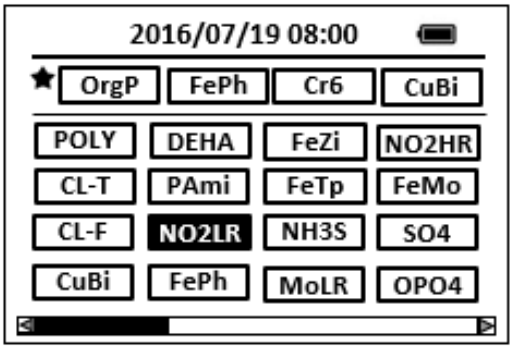

Figure 293

3. Press the OK key to enter **NO2LR** test program interface.

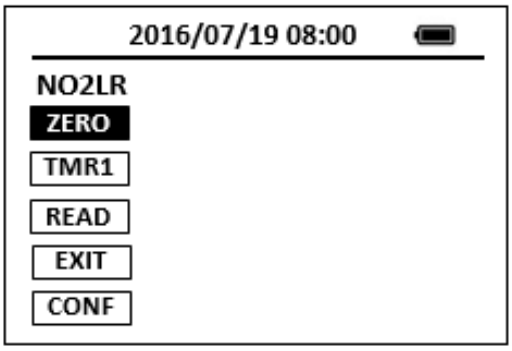

Figure 294

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

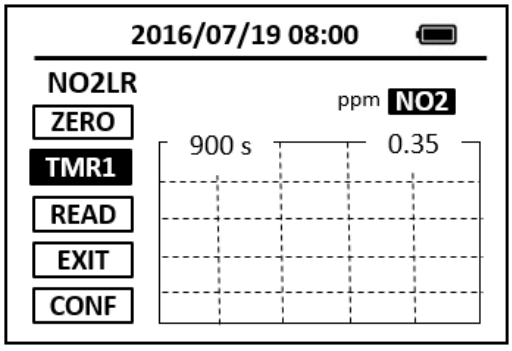

Figure 295

6. Take the sample vial out and add the contents of one NitriVer 3 Nitrite Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent. *Note: Accuracy is not affected by undissolved powder.*
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

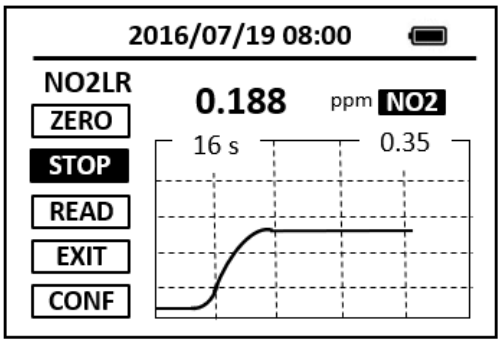

Figure 296

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8507

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

56. Nitrate, High Range - NO3HR

Test Program

Description：SP-800 Nitrate High Range Method (0.8-30.0 ppm N) (Cadmium Reduction Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH NitraVer 5 Nitrate Reagent Powder (Cat. No.21061-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

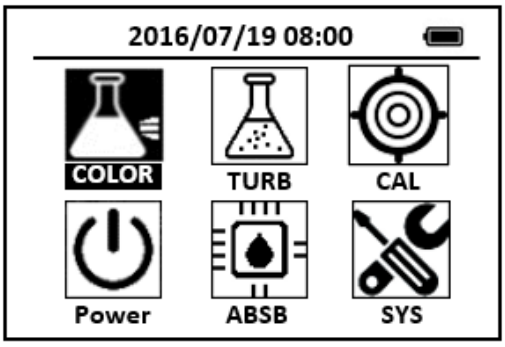

Figure 297

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NO3HR** icon.

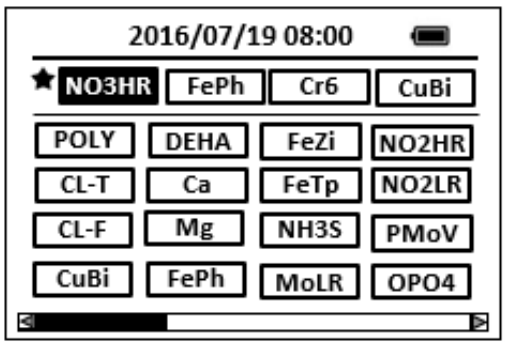

Figure 298

3. Press the OK key to enter **NO3HR** test program interface.

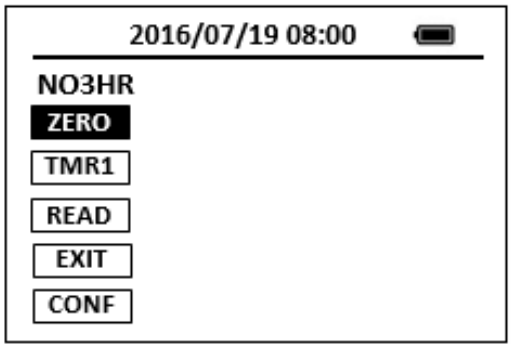

Figure 299

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

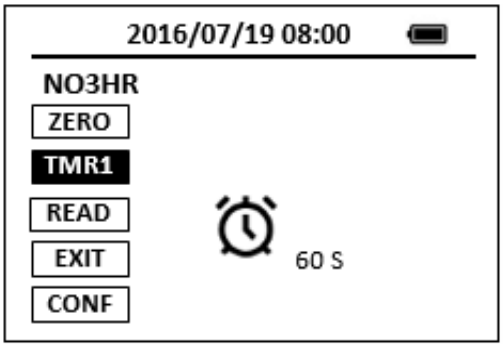

Figure 300

6. Take the sample vial out and add the contents of one NitraVer 5 Nitrate Reagent Powder Pillow to the sample vial (the prepared sample), Cap the sample vial.

   Note：It is important to remove all of the powder from the foil pillow. Tap the pillow until no more powder pours out.
7. Press the **TMR1** key to start the method timer, 1-minute reaction period will begin. Shake the sample vigorously until the timer beeps.
   Note: It is important to shake the vial vigorously. Shaking time and technique influence color development. For most accurate results, do successive tests on a standard solution and adjust the shaking time to obtain the correct result.
8. After the timer beeps, place sample vial back into the sample vial compartment and press the **TMR2** key to start the method timer, A 5-minute reaction period will begin.
   Note: A deposit will remain after the reagent dissolves and will not affect test results.
   Note: An amber color will develop if nitrate nitrogen is present.

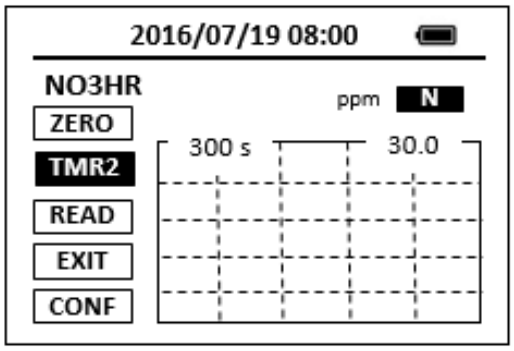

Figure 301

9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

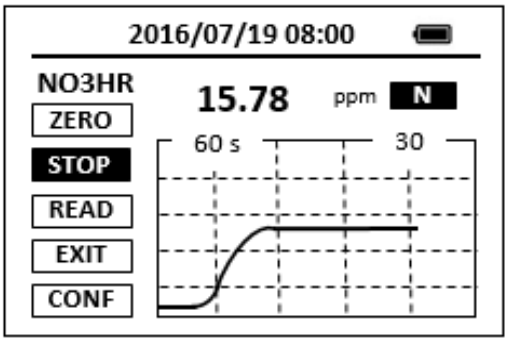

Figure 302

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the STOP key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8039

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*

4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

57. Nitrate, Mid-Range - NO3MR

Test Program

Description：SP-800 Nitrate Mid-Range Method (0.2-5.0 ppm N) (Cadmium Reduction Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH NitraVer 5 Nitrate Reagent Powder Pillows (Cat. No. 21061-69)

Program

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

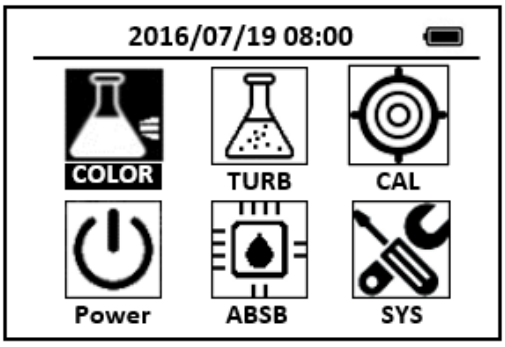

Figure 303

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NO3MR** icon.

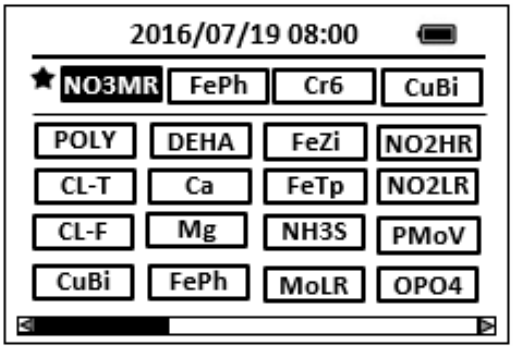

Figure 304

3. Press the OK key to enter **NO3MR** test program interface.

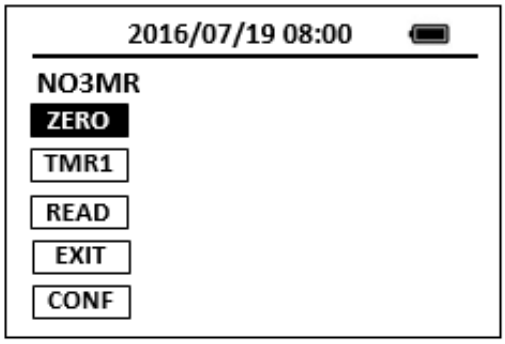

Figure 305

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

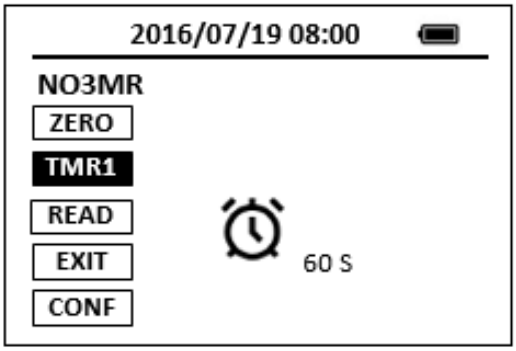

Figure 306

6. Take the sample vial out and add the contents of one NitraVer 5 Nitrate Reagent Powder Pillow to the sample vial (the prepared sample), Cap the sample vial.

   Note：It is important to remove all of the powder from the foil pillow. Tap the pillow until no more powder pours out.
7. Press the **TMR1** key to start the method timer, 1-minute reaction period will begin. Shake the sample vigorously until the timer beeps.
   Note: It is important to shake the vial vigorously. Shaking time and technique influence color development. For most accurate results, do successive tests on a standard solution and adjust the shaking time to obtain the correct result.
8. After the timer beeps, Place sample vial back into the sample vial compartment and press the **TMR2** key to start the method timer, a 5-minute reaction period will begin.
   Note: A deposit will remain after the reagent dissolves and will not affect test results.
   Note: An amber color will develop if nitrate nitrogen is present.

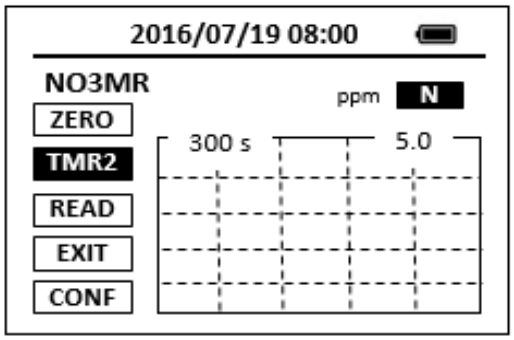

Figure 307

9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

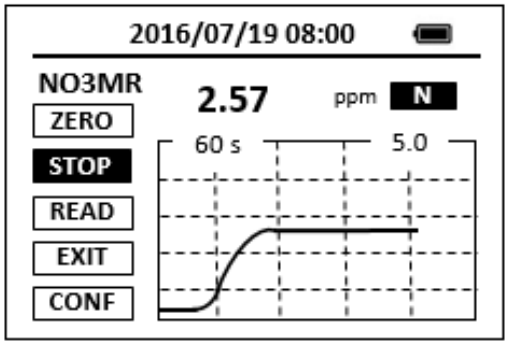

Figure 308

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8171

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*

4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

58. Nitrate, High Range (Test ‘N Tube Method) - NO3CA

Test Program

Description：SP-800 NO3CA Method (0.3-30.0 ppm NO3-N) (Chronotropic Acid Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. COD/TNT adapter
3. HACH NitraVer X Nitrate, High Range Test ‘N Tube Reagent Set (Cat. No. 26053-45)
   Includes:
   (1) Nitrate Pretreatment Solution Vials (Cat. No. *)
   (2) NitraVer X Reagent B Powder Pillows (Cat. No. 26055-46)

Program:

1. Insert the COD/TNT adapter into the vial holder until it drops into place. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter.
2. Use a pipet to add 1.0 ml of sample to a Nitrate Pretreatment Solution Vial (the blank).
3. Cap the tube and invert 10 times to mix.
   Note: This test is technique sensitive. Low results may occur if these instructions are not followed. Hold the vial vertical with the cap up. Invert the vial so the cap points down. Wait for all of the solution to flow to the cap end. Pause. Return the vial to the upright position. Wait for all the solution to flow to the vial bottom. This process equals 1 inversion. Do these 10 times.
4. Clean the outside of the vial with a towel.
   Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks
5. Place the blank in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
6. Cover the vial tightly with the instrument cap.
7. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

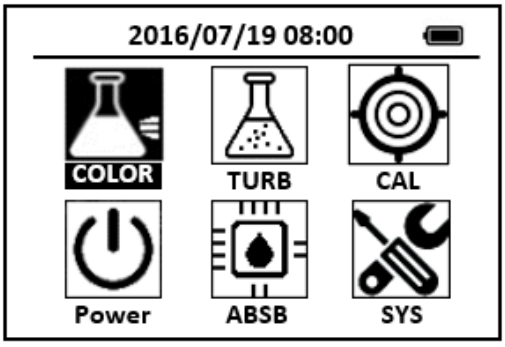

Figure 309

8. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **NO3CA** icon.

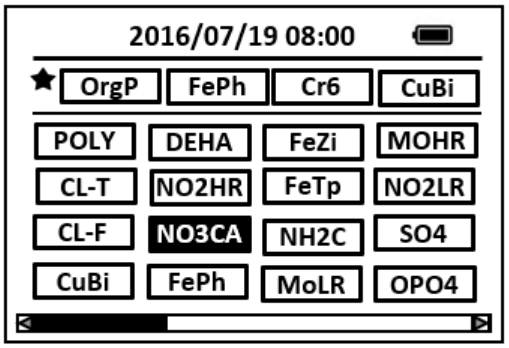

Figure 310

9. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

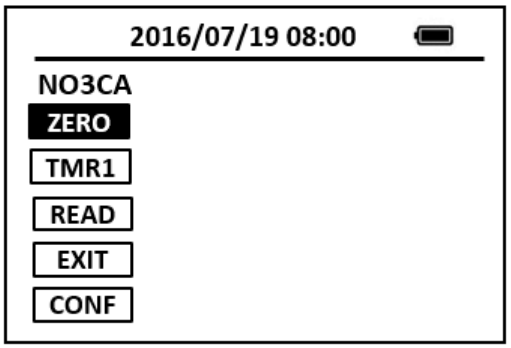

Figure 311

10. Remove the cap from the vial. Using a funnel, add the contents of one NitraVer X Reagent B Powder Pillow to the vial.
11. Cap tightly and invert 10 times to mix (this will be the prepared sample).
    Note: Some solid matter will not dissolve.
12. Place sample vial back into the sample vial compartment and press the **TMR1** key to start the method timer, a 5-minute reaction period will begin. Do not invert the vial again.
    Note: A yellow color will develop if nitrate nitrogen is present.
    Note: Complete Steps 13-16 within five minutes after the timer beeps.

13. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
14. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

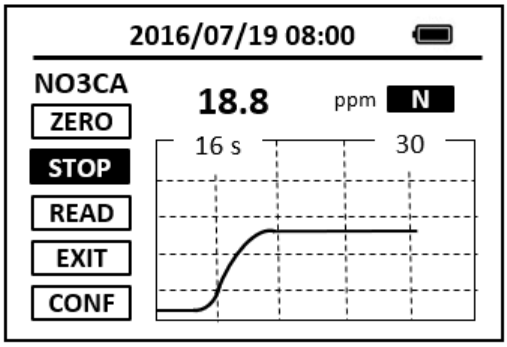

Figure 312

15. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.
16. Press EXIT key to return to the main page.

The method is compatible with HACH 10020

Notes:

1. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
2. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
3. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

59. Ozone - O3

Test Program

Description：SP-800 Ozone Method (0.1-2.00 ppm O3) (DPD Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis O3 Reagent (PN: 31118)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

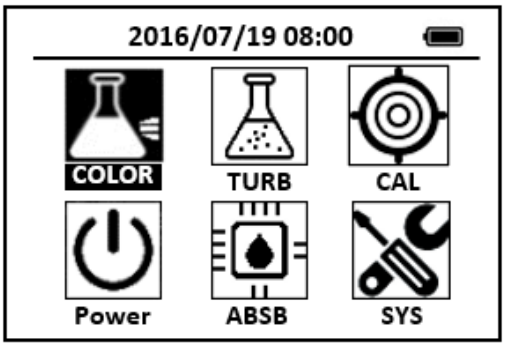

Figure 313

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **O3** icon.

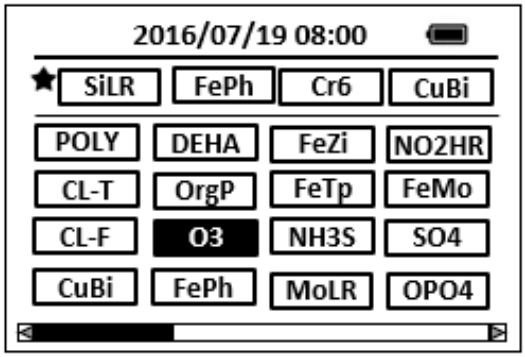

Figure 314

3. Press the OK key to enter **O3** test program interface.

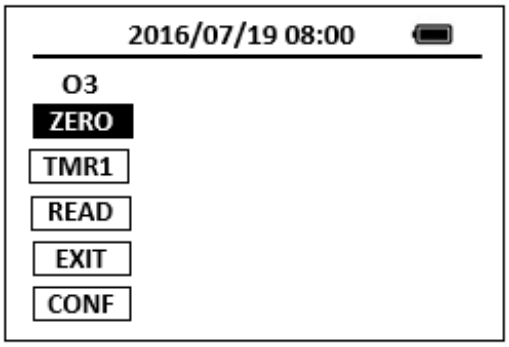

Figure 315

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

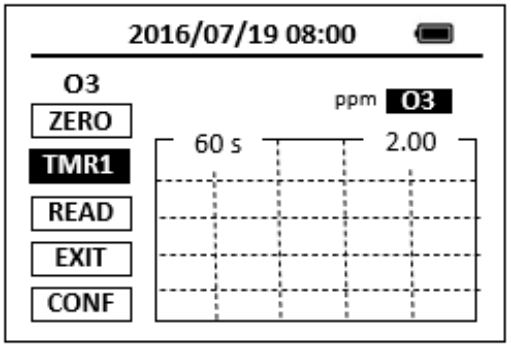

Figure 316

6. Take the sample vial out and add the contents of one O3 regent to the sample vial. Swirl the vial to mix the reagent.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time.
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

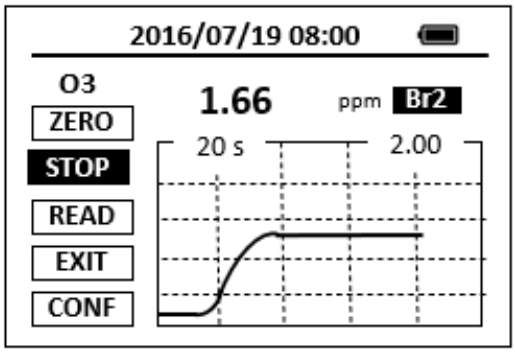

Figure 317

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

60. Peroxyacetic - PAA

Test Program

Description：SP-800 Peroxyacetic Method (25.0-500.0 ppm PAA) (Iodimetry Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis PAA Reagent (PN: 31079)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

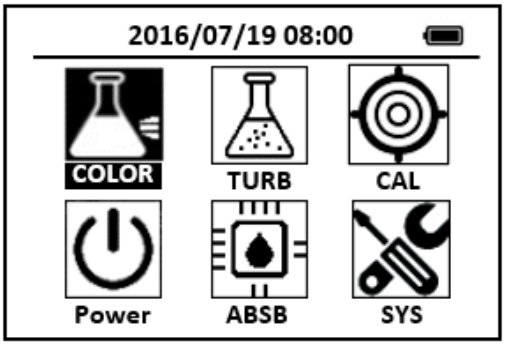

Figure 318

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **PAA** icon.

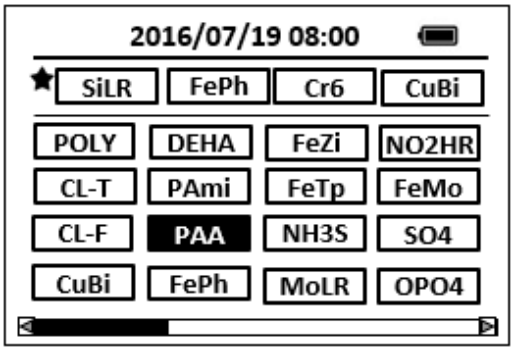

Figure 319

3. Press the OK key to enter **PAA** test program interface.

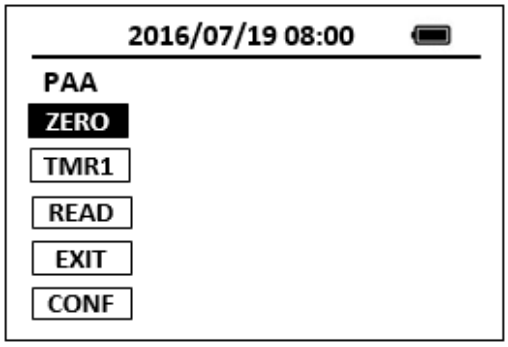

Figure 320

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial.
   Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

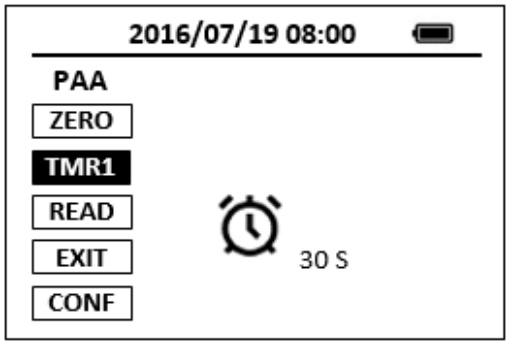

Figure 321

6. Take the sample vial out and add the PAA reagent to the sample vial (the prepared sample), Cap the sample vial.
7. Press the **TMR1** key to start the method timer, 30-seconds reaction period will begin. Shake the sample vial until the timer beeps.
8. After the timer beeps, place sample vial back into the sample vial compartment and press the **TMR2** key to start the method timer, A 30-seconds reaction period will begin.

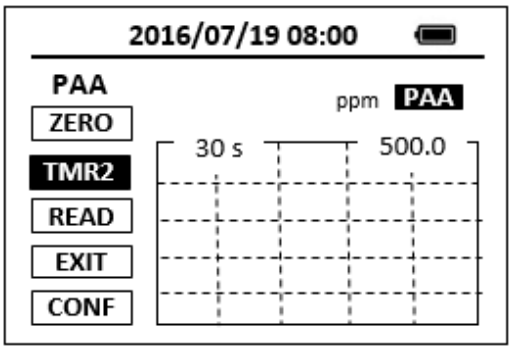

Figure 322

9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

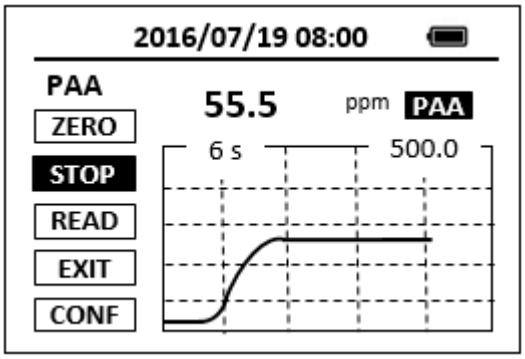

Figure 323

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
2. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
3. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

61. Phosphorus, Reactive - OPO4

Test Program

Description：SP-800 Orthophosphate Method (0.05-2.50 ppm PO4) (Molybdenum Blue Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH PhosVer 3 Phosphate Reagent Powder Pillows (Cat. No. 21060-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

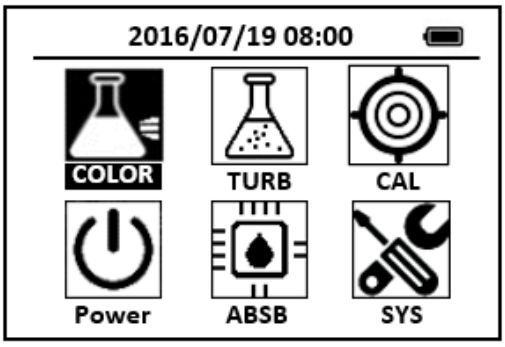

Figure 324

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **OPO4** icon.

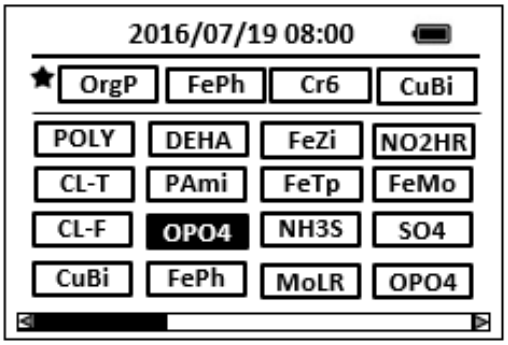

Figure 325

3. Press the OK key to enter **OPO4** test program interface.

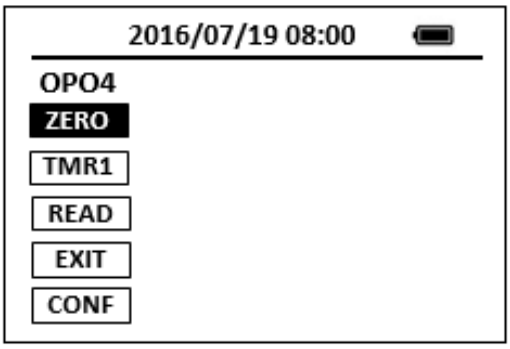

Figure 326

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
   Note: Clean glassware with 1:1 HCl. Rinse again with deionized water. Do not use detergents containing phosphates to clean glassware.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

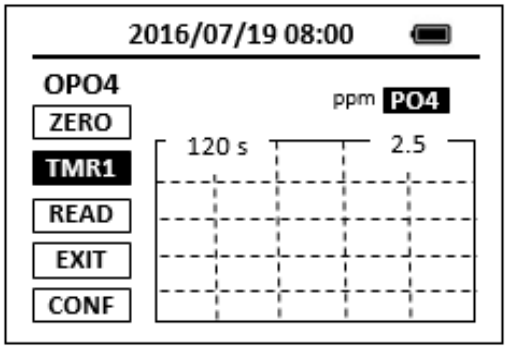

Figure 327

6. Take the sample vial out and add the contents of one PhosVer 3 Phosphate Powder Pillow to the sample vial. Swirl the vial to mix the reagent. Shake for 15 seconds.
   Note: A blue color will develop if phosphate ion is present.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

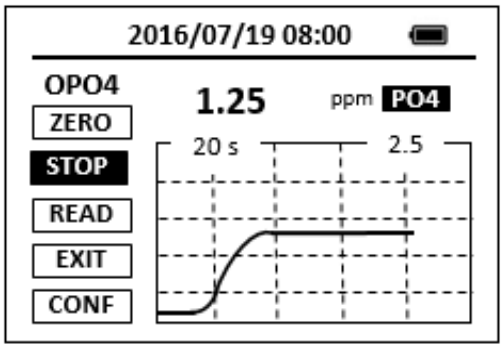

Figure 328

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8048

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

62. Phosphonates - OrgP

Test Program

Description：SP-800 Phosphonates Method (0.05-2.50 ppm PO4) (Persulfate UV Oxidation Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Ultraviolet (UV) lamp,115V,60HZ
4. UV safety goggles
5. 25-ml sample Vial
6. 50-ml graduated mixing Cylinder
7. HACH Phosphonates Reagent Set (Cat. No. 24297-00)
   Includes:
   (1) PhosVer 3 Phosphate Reagent Powder Pillows (Cat. No. 21060-69)
   (2) Potassium Persulfate Pillow for Phosphonate (Cat. No. 20847-69)

Program:

1. Choose the appropriate sample size from Table 1 below. Pipet the chosen sample volume into a 50-ml graduated mixing cylinder. Dilute the sample to 50 ml with deionized water. Mix well.
   Note: Clean glassware with 1:1 hydrochloric acid, followed by a deionized water rinse.Do not use commercial detergents containing phosphates to clean glassware.

Table 3

Expected Range (mg/L phosphonate)	Sample Volume (ml)
0-2.5	50
0-5	25
0-12.5	10
0-25	5
0-125	1

2. Fill a sample vial to the 10-ml mark with diluted sample from Step 1 (label this as the blank).
3. Fill another sample vial to the 25-ml mark with diluted sample from Step 1 (label this as the sample).
4. Add the content of one Potassium Persulfate for Phosphonate Powder Pillow to the vial labeled as “sample”. Swirl to mix. This vial contains the prepared sample.
5. Insert the ultraviolet (UV) lamp into the prepared sample.

Note: Wear UV safety goggles while the lamp is on.
Note: Do not handle the lamp surface. Fingerprints will etch the glass. Wipe lamp with a soft, clean tissue between samples. Do not use detergents with phosphates to wash glassware.
Note: A specially designed cord adapter is available for performing two digestions with a single power supply. A second UV lamp is required.

6. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

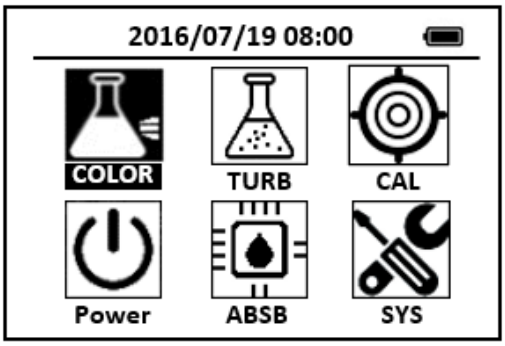

Figure 329

7. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **OrgP** icon.

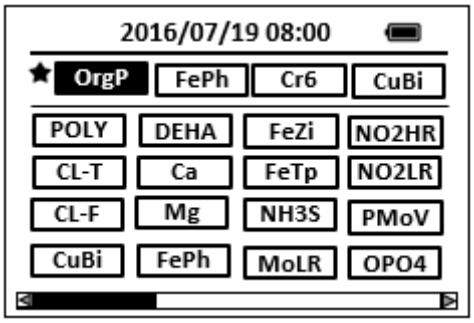

Figure 330

8. Press the OK key to enter **OrgP** test program interface.

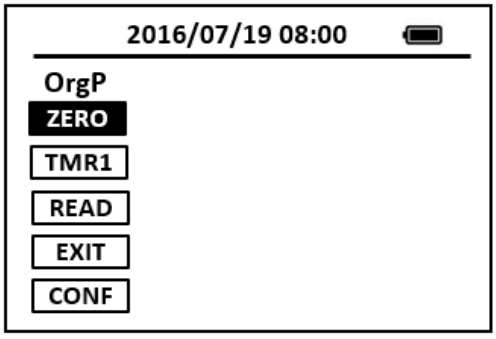

Figure 331

9. Press the **ZERO** key. Pyxis SP-800 will display the page.

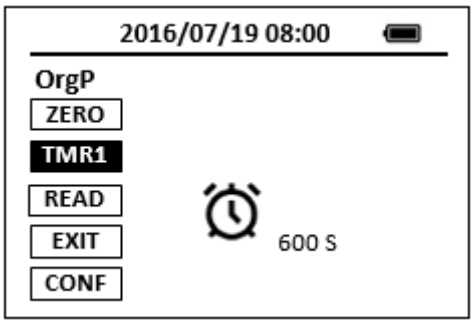

Figure 332

10. Turn on the UV lamp to digest the prepared sample.
11. Press the **TMR1** key to start the method timer, a 10-minute reaction period will begin.
    Note: A blue color will develop if iron is present.
    Note: Phosphonates are converted to ortho- phosphate in this step.
    Note: The digestion step may take less time. Contaminated samples or a weak lamp could result in incomplete digestion. Check efficiency by running a longer digestion to see if readings increase.
12. When the timer beeps, turn off the UV lamp. Remove it from the sample vial.
13. Pour 10 ml of sample from the vial labeled as “sample” into a second sample vial. This is the prepared sample.
14. Add the contents of one PhosVer 3 Phosphate Reagent Powder Pillow for 10-ml samples to each sample vial. Swirl immediately to mix.
    Note: A blue color will form if phosphate is present. Sample and blank vials may develop color.
15. Press the **TMR2** key to start the method timer, a 2-minute reaction period will begin.
    Note: If sample is colder than 15 °C, 4 minutes are required for color development.

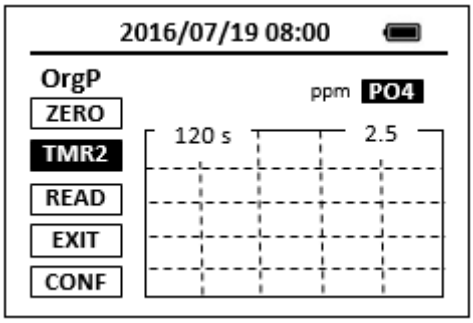

Figure 333

16. When the timer reaches the preset time and the reaction is complete, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.

17. Use a soft cloth or lint free paper tissue to clean the sample vial.
18. Insert the COD/TNT adapter into the vial holder by rotating the adapter until it drops into place. Then push down to fully insert it.
19. Repeat step 7, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
    Note: Perform Steps 18-19 within three minutes after the timer beeps.
20. Place the prepared sample into the sample vial compartment. Tightly cover the sample vial with the instrument cap.
21. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
22. Concentration value based on the last absorbance value measured will be calculated and displayed.

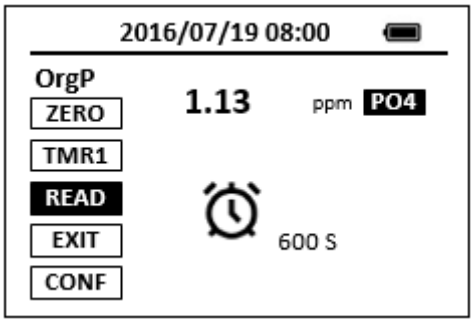

Figure 334

23. Press EXIT key to return to the main page.
24. Results may be expressed in terms of a specific active phosphonate by using the appropriate conversion factor and the equation found in Table 3.

Table 4

Sample Volume (ml) (chosen in Step 1)	Multiplier
50	1
25	2
10	5
5	10
1	50
Phosphate concentration = Instrument Reading x Multiplier	

Table 5

Phosphonate Type	Conversion Factor
PBTC	2.84
NTP	1.050
HEDPA	1.085
EDTMPA	1.148
HMDTMPA	1.295

DETPMPA	1.207
HPA	1.49
Active Phosphonate (mg/L) = Phosphate concentration from Step 20 x Conversion Factor	

The method is compatible with HACH 8007

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

63. Phosphorus, Reactive - Pami

Test Program

Description：SP-800 Phosphorus, Reactive Method (0.2-30.0 ppm PO4) (Amino Acid Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH High Range Reactive Phosphorus Reagent Set (Cat. No. 22441-00) Includes:
   (1) Amino Acid Reagent (Cat. No. 1934-32)
   (2) Molybdate Reagent (Cat. No. 2236-32)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

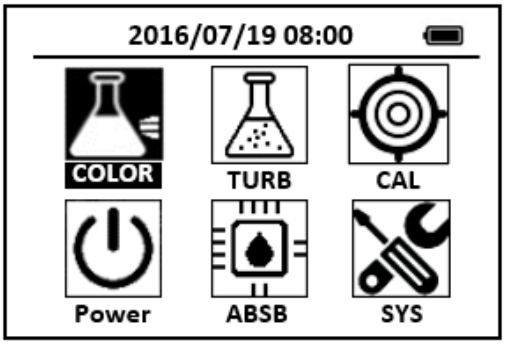

Figure 335

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Pami** icon.

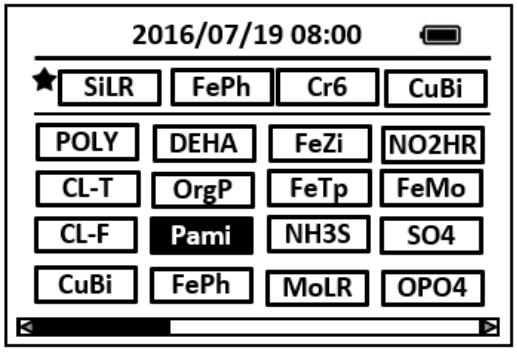

Figure 336

3. Press the OK key to enter **Pami** test program interface.

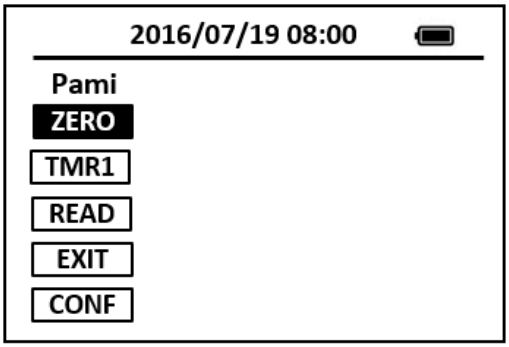

Figure 337

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

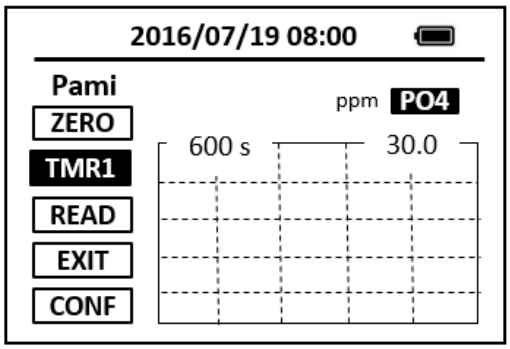

Figure 338

6. Take the sample vial out and add 0.4 ml of Molybdate Reagent using a calibrated dropper. Cap and invert several times to mix.
7. Add 0.4 ml of Amino Acid Reagent Solution. Cap and invert several times to mix (the prepared sample).
   Note: A blue color will form if phosphate is present.
8. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 10-minute reaction period will begin.
9. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
10. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

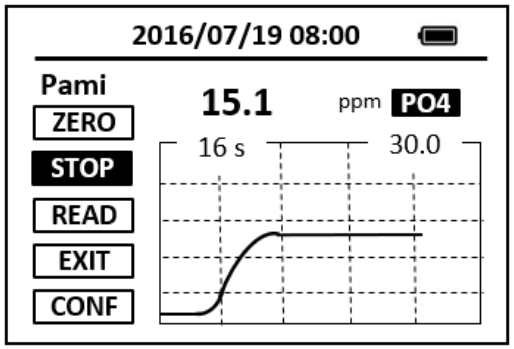

Figure 339

11. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8178

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

64. Phosphorus, Total (Test 'N Tube Method) - P-TLR

Test Program

Description：SP-800 Total Phosphorus Low Range Method (0.06-3.50 ppm PO4) (Test 'N Tube Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. COD/TNT adapter
4. HACH Total Phosphorus Test 'N Tube Reagent Set (Cat. No. 27426-45)
   Includes:
   (1) PhosVer 3 Phosphate Reagent Powder Pillows (Cat. No. 21060-46)
   (2) Potassium Persulfate powder Pillows (Cat. No. 20847-66)
   (3) Sodium Hydroxide Solution, 1.54 N (Cat. No. 27430-42)
   (4) Test 'N Tube Acid Dilution Vials (Cat. No. *)

Program:

1. Turn on the RD-800 Reactor. Preheat to 150 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
2. Insert the COD/TNT adapter into the vial holder until it drops into place. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band
3. Use a pipet to add 5.0 ml of sample to a Total and Acid Hydrolyzable Test Vial.
   Note: Adjust the pH of stored samples to 6-8before analysis.
4. Using a funnel, add the contents of one Potassium Persulfate Powder Pillow for Phosphonate to the vial.
5. Cap tightly and shake to dissolve.
6. Place the vial in the Reactor. Heat the vial for 30 minutes.
7. Carefully remove the vial from the reactor. Place it in a test tube rack and allow to cool to room temperature.
   Note: Vials will be hot.
8. Use a pipet to add 2.0 ml of 1.54 N sodium hydroxide to the vial. Cap and mix.
9. Clean the outside of the vial with a towel.
   Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks.
10. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.

11. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

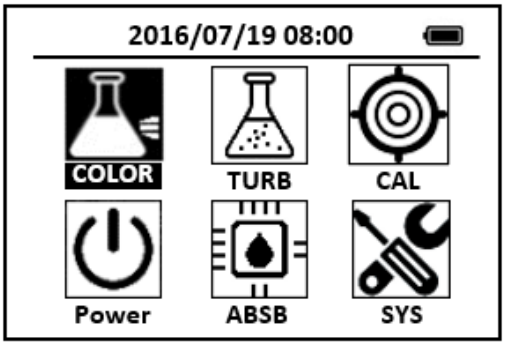

Figure 340

12. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **P-TLR** icon.

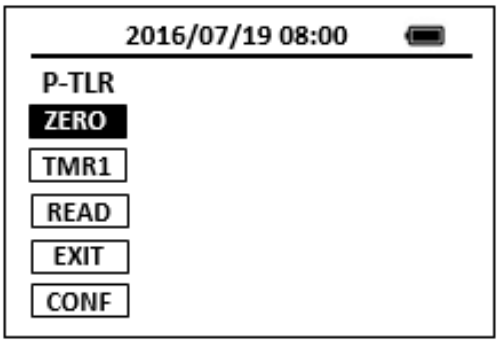

Figure 341

13. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

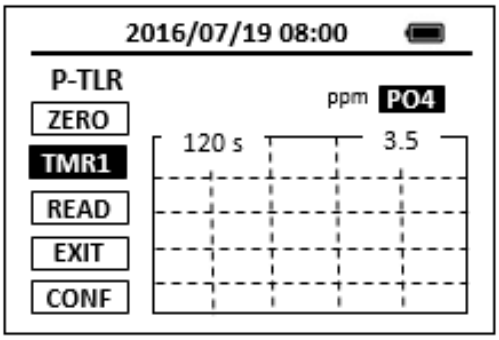

Figure 342

14. Remove the cap from the vial. Using a funnel, add the contents of one PhosVer 3 Phosphate Reagent Powder Pillow to the vial.
15. Cap tightly and shake for 10-15 seconds.
    Note: The powder will not completely dissolve.
16. Place sample vial back into the sample vial compartment and press the **TMR1** key to start the method timer, a 2-minute reaction period will begin.
    Note: Read samples between 2 and 8 minutes after the addition of the PhosVer 3 Phosphate reagent.
    Note: A blue color will form if phosphate is present.

17. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
18. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

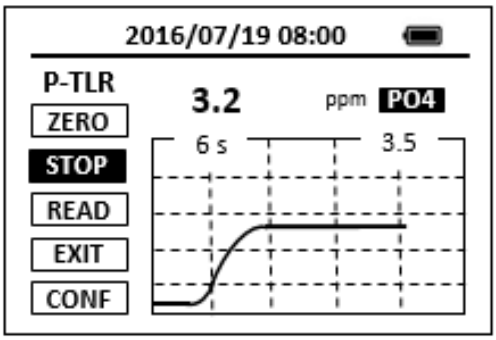

Figure 343

19. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.
20. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8190

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

65. Phosphorus, Total (Test 'N Tube Method) - P-THR

Test Program

Description：SP-800 Total Phosphorus High Range Method (1.0-100.0 ppm PO4) (Test 'N Tube Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. COD/TNT adapter
4. HACH Total High Range Phosphorus Test 'N Tube™ Reagent Set (Cat. No. 27672-45)
   Includes:
   (1) Molybdovanadate Reagent (Cat. No. 20760-26)
   (2) Potassium Persulfate Powder Pillows (Cat. No. 20847-66)
   (3) Sodium Hydroxide Solution, 1.54 N (Cat. No. 27430-42)
   (4) Total Phosphorus Test 'N Tube™ Vials (Cat. No. *)

Program:

1. Turn on the RD-800 Reactor. Preheat to 150 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
2. Insert the COD/TNT adapter into the vial holder until it drops into place. Then push down to fully insert it.
   Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band
3. Use a pipet to add 5.0 ml of deionized water to a Total Phosphorus Test 'N Tube Vial (the blank).
4. Use a pipet to add 5.0 ml of sample to a Total Phosphorus Test 'N Tube Vial (the sample).
   Note: Adjust the pH of stored samples to 6-8before analysis.
5. Using a funnel, add the contents of one Potassium Persulfate Powder Pillow for Phosphonate to each vial.
6. Cap tightly and shake to dissolve.
7. Place the vials in the Reactor. Heat for 30 minutes.
8. Carefully remove the vials from the reactor. Place them in a test tube rack and allow to cool to room temperature (18–25 °C).
   Note: Vials will be hot.
9. Use a pipet to add 2.0 ml of 1.54 N sodium hydroxide to each vial. Cap and invert to mix.
10. Use a polyethylene dropper to add 0.5 ml of Molybdovanadate Reagent to

each vial. Cap and invert to mix

11. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.
12. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

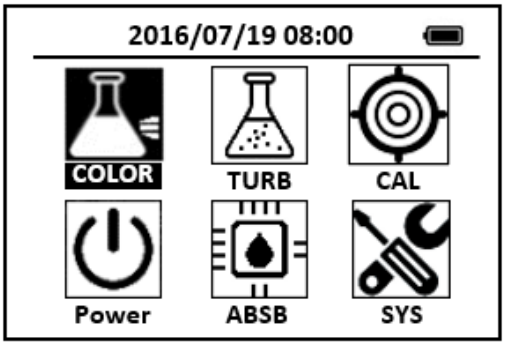

Figure 344

13. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **P-THR** icon.

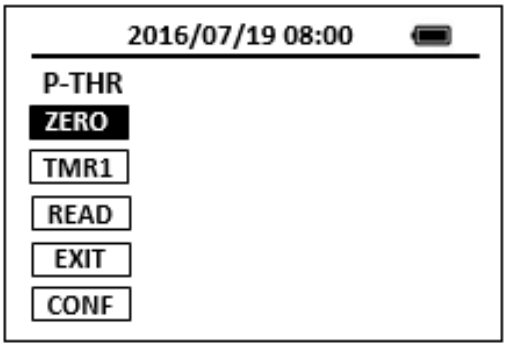

Figure 345

14. Press the **ZERO** key. Pyxis SP-800 will display the page.

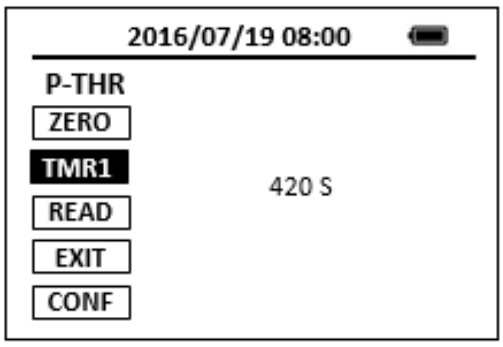

Figure 346

15. Press the **TMR1** key to start the method timer, a 7-minute reaction period will begin.
16. When the timer reaches the preset time and the reaction is complete, clean the outside of the vial with a towel.
    Note: Wiping with a damp towel, followed by a dry one, will remove

fingerprints or other marks.

17. Repeat step 5, place the blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
18. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
19. Concentration value based on the last absorbance value measured will be calculated and displayed.

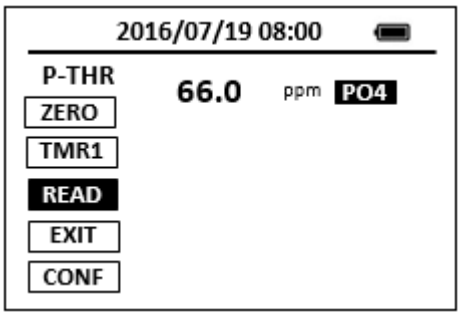

Figure 347

20. Press **EXIT** key to return to the main page.

The method is compatible with HACH 10127

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

66. Potential of Hydrogen - pH

Test Program

Description：SP-800 Potential of Hydrogen Method (6.5-8.5) (Colorimetric PH Determination Using Phenol Red)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Phenol Red Indicator Solution, spec grade (Cat. No. 26575-12)
4. Dropper, 0.5&1.0 mL marks (Cat. No. 21247-20)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

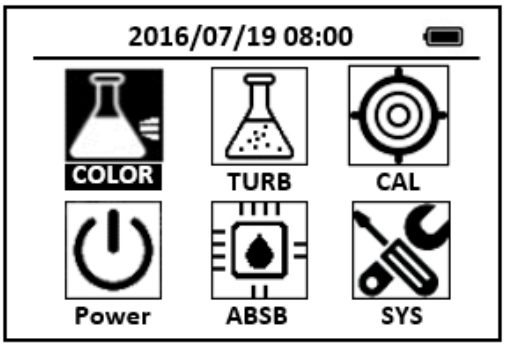

Figure 348

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **pH** icon.

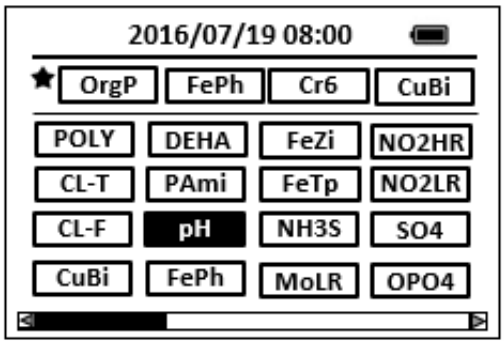

Figure 349

3. Press the OK key to enter **pH** test program interface.

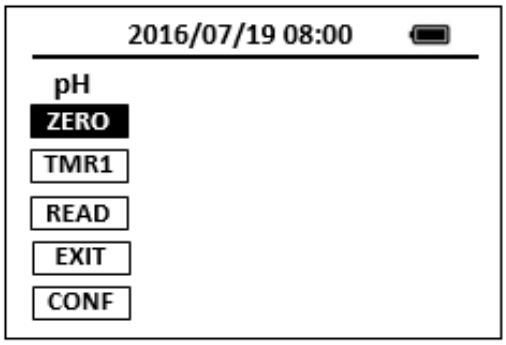

Figure 350

4. Fill a sample vial to the 10-ml line with sample (the blank sample)
   Note: Sample temperature must be 21-29 °C.
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

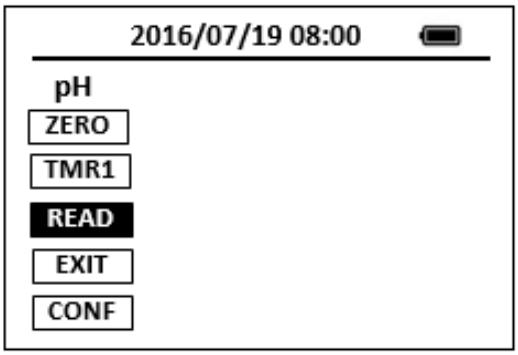

Figure 351

6. Take the sample vial out, using a disposable dropper, add 1 ml of Phenol Red Indicator Solution to the vial (the prepared sample). Cap the sample vial and invert twice to mix.
7. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
8. Concentration value based on the last absorbance value measured will be calculated and displayed.

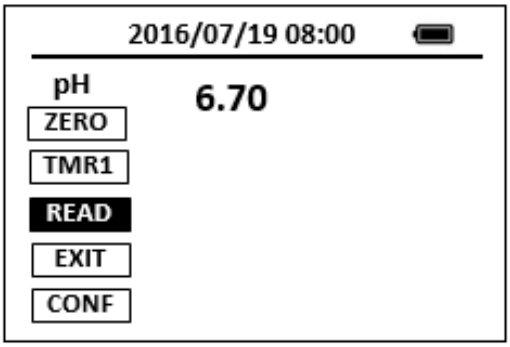

Figure 352

9. Press **EXIT** key to return to the main page.

The method is compatible with HACH 10076

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

67. Phosphorus, Reactive - PMoV

Test Program

Description：SP-800 Phosphorus, Reactive Method (0.2-45.0 ppm PO4) (Molybdovanadate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH Molybdovanadate Reagent (Cat. No. 20760-32)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

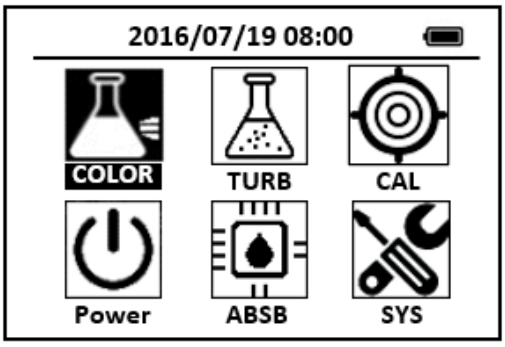

Figure 353

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **PMoV** icon.

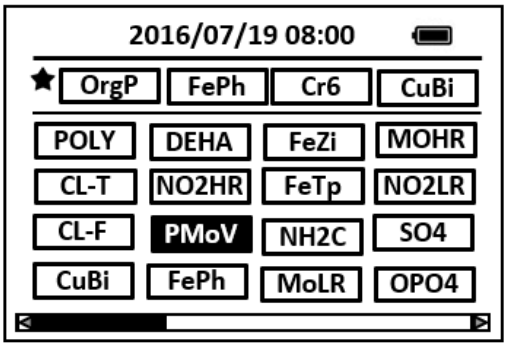

Figure 354

3. Press the OK key to enter **PMoV** test program interface.

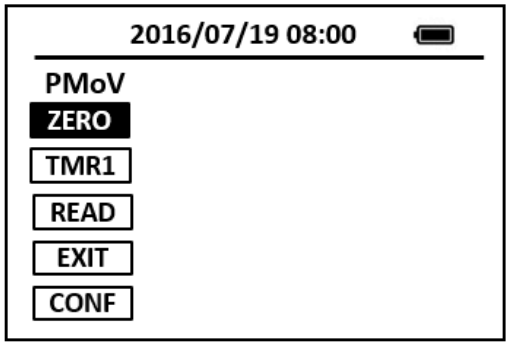

Figure 355

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
   Note: For best results, the sample temperature should be 20-25 °C.
6. Add 0.4 ml of Molybdovanadate Reagent to each sample vial. Cap the vials and invert to mix.
   Note: A yellow color will form if phosphate is present. A small amount of yellow will be present in the blank, because of the reagent.
7. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

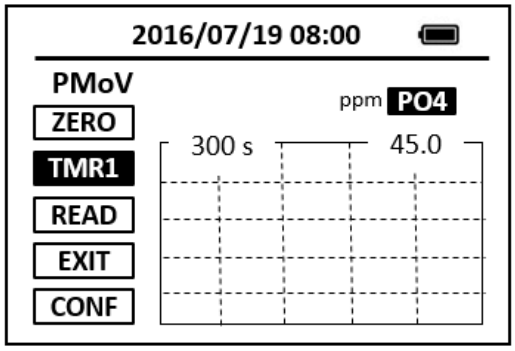

Figure 356

8. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
9. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
10. Use a soft cloth or lint free paper tissue to clean the sample vial.
11. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
13. A new concentration value based on the last absorbance value measured will be calculated and displayed.

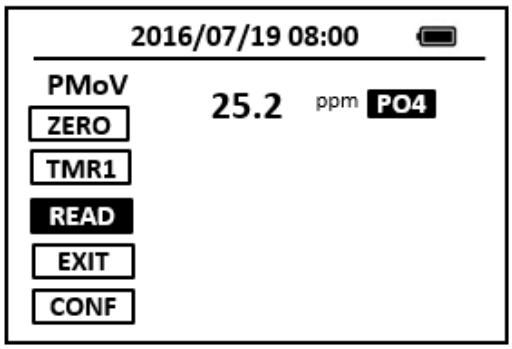

Figure 357

14. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8114

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

68. Polymer - POLY

Test Program

Description：SP-800 Polymer Method (2.0-14.0 ppm PAA) (Turbidimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis POLY Reagent (PN: 31092)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

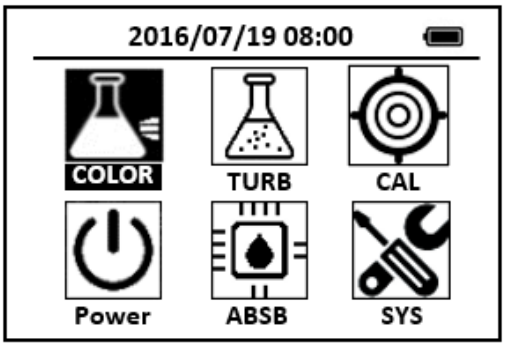

Figure 358

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **POLY** icon.

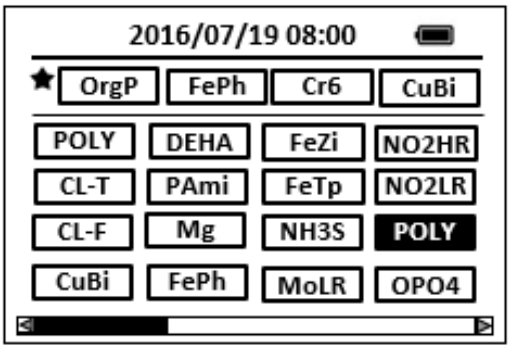

Figure 359

3. Press the OK key to enter **POLY** test program interface.

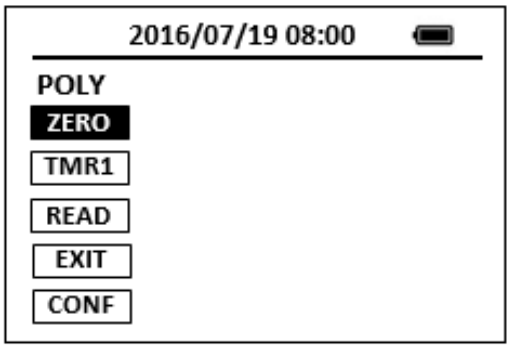

Figure 360

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Fill another sample vial to the 10-ml line with sample (the prepared sample).
6. Add the content of POLY-1 reagent to blank vial. add the content of POLY-2 reagent to sample vial. Cap the vials and invert to mix 20 second.
   Note: It is important to shake the vial vigorously. Shaking time and technique influence color development. For most accurate results, do successive tests on a standard solution and adjust the shaking time to obtain the correct result.
7. Press the **ZERO** key. Pyxis SP-800 will display the page.

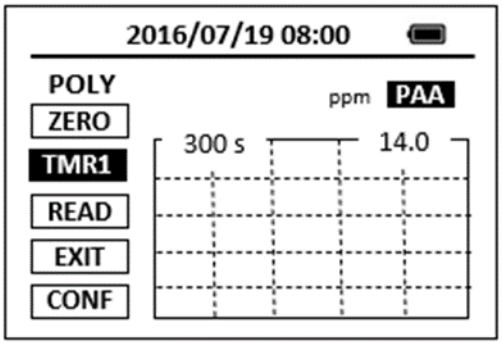

Figure 361

8. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
9. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
10. Use a soft cloth or lint free paper tissue to clean the sample vial.
11. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
12. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
13. Concentration value based on the last absorbance value measured will be calculated and displayed.

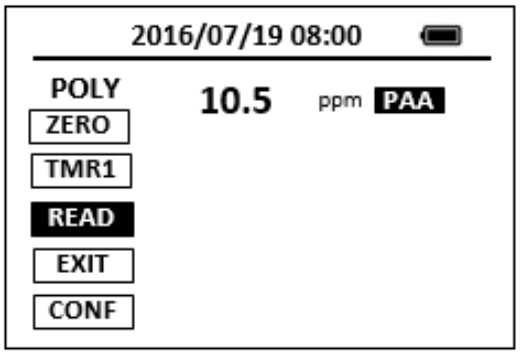

Figure 362

14. Press EXIT key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

69. Antimony Trivalent - Sb3+

Test Program

Description：SP-800 Antimony Trivalent Method (0.01-0.10 ppm Sb) (PADAP Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 100-ml Graduated Cylinder
4. Separatory Funnel
5. Pyxis Sb3+ Reagent (PN: 31107)
   Includes:
   (1) Sb3+ -1
   (2) Sb3+ -2
   (3) Sb3+ -3
   (4) Sb3+ -4

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

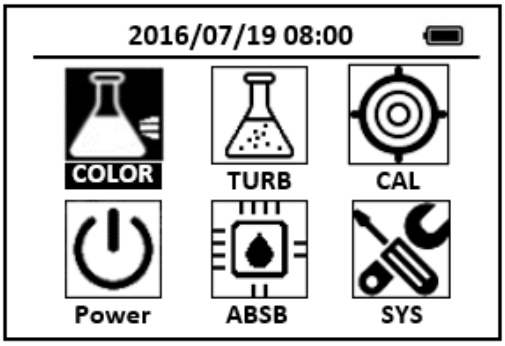

Figure 363

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Sb3+** icon.

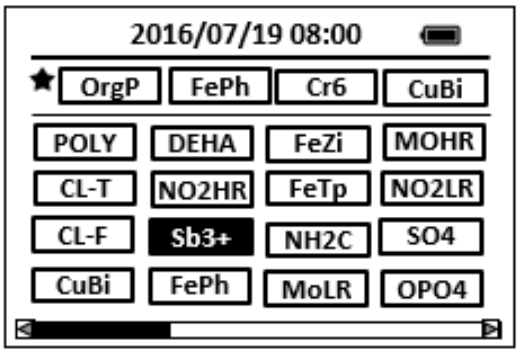

Figure 364

3. Press the OK key to enter **Sb3+** test program interface.

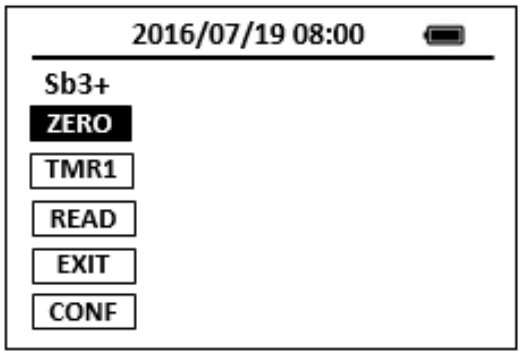

Figure 365

4. Accurately measure 100- ml deionized water into separatory funnel (the blank sample).
5. Accurately measure 100-ml sample into separatory funnel (the prepared sample).
6. Add 3.3 ml of Sb3+ -2 reagent to each sample vial. Cap the vials and invert to mix.
7. Add 1 ml of Sb3+ -3 reagent to each sample vial. Cap the vials and invert to mix.
8. Add 2ml of Sb3+ -4 reagent to each sample vial. Cap the vials and invert to mix.
9. Add 1ml of Sb3+ -1 reagent to each sample vial. Cap the vials and invert to mix.
10. Add 8ml benzene to each sample vial. Cap the vials and shake out the vials for 1 minutes, let stand for 10 minutes.
11. Move the benzene solution into each 10 ml sample vial separately.
12. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

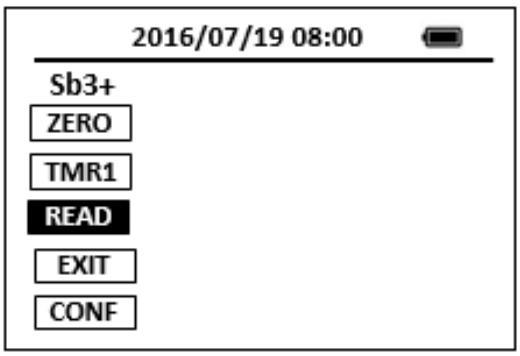

Figure 366

13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

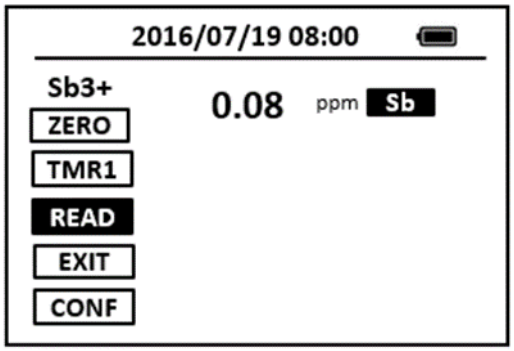

Figure 367

15. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

70. Antimony, Total - Sb-T

Test Program

Description：SP-800 Total Antimony Total Method (0.01–0.10 ppm Sb) (PADAP Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 100-ml Graduated Cylinder
4. Hot Plate
5. Separatory Funnel
4. Pyxis Sb-T Reagent (PN: 31108)
   Includes:
   (1) Sb-T -1
   (2) Sb-T -2
   (3) Sb-T -3
   (4) Sb-T -4

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

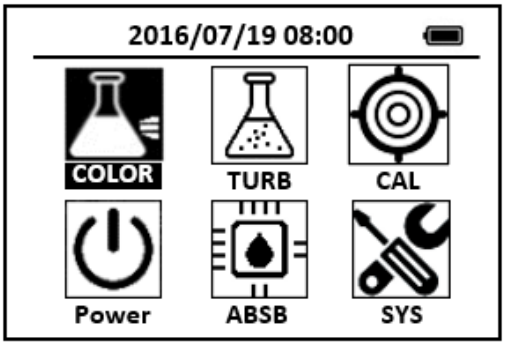

Figure 368

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Sb-T** icon.

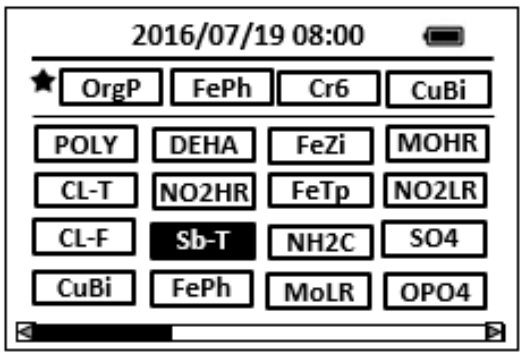

Figure 369

3. Press the OK key to enter Sb-T test program interface.

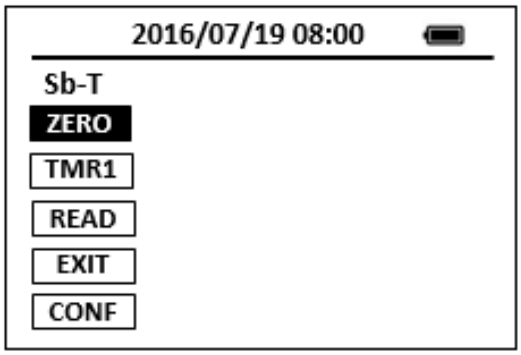

Figure 370

4. Accurately measure 100- ml deionized water into beaker (the blank sample).
5. Accurately measure 100-ml sample into beaker (the prepared sample).
6. Add 3.3 ml of Sb-T-2 reagent to each sample vial and mix the solution well.
7. Add 1 ml of Sb-T-3 reagent to each sample vial and mix the solution well.
8. Place the beakers on a hot plate, Boil gently for 20 minutes.
9. Cool the sample to room temperature.
10. Pour the blank into a 100ml graduated cylinder, use deionized water return the volume to 100ml, mix it and pour into separatory funnel.
11. Pour the sample into a 100ml graduated cylinder, use deionized water return the volume to 100 ml, mix it and pour into separatory funnel.
12. Add 2ml of Sb-T-4 reagent to each separatory funnel. Cap the vials and invert to mix.
13. Add 1ml of Sb-T-1 reagent to each sample vial. Cap the vials and invert to mix.
14. Add 8ml benzene to each sample vial. Cap the vials and shake out the vials for 1 minutes, let stand for 10 minutes.
15. Move the benzene solution into 10 ml sample vial separately.
16. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

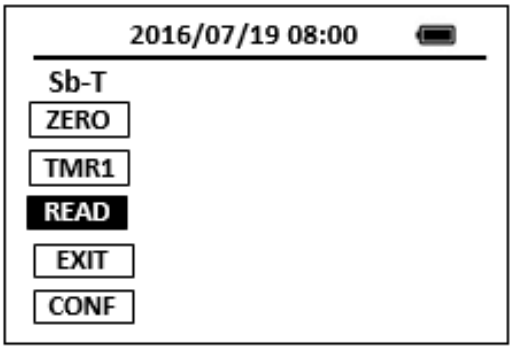

Figure 371

17. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
18. Concentration value based on the last absorbance value measured will be calculated and displayed.

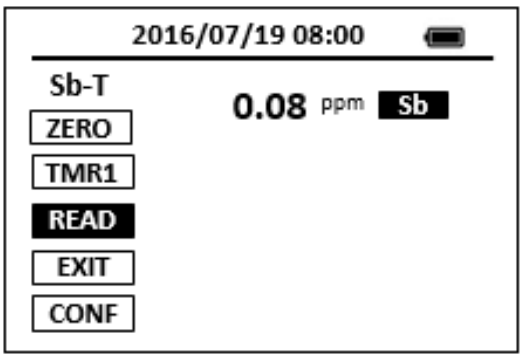

Figure 372

19. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

71. Sulfide - S2-

Test Program

Description：SP-800 Sulfide Method (0.01-0.70 ppm S^{2-}) (Methylene Blue Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Sulfide Reagent (Cat. No. 22445-00)
   Includes:
   (1) Sulfide 1 Reagent (Cat. No. 1816-32)
   (2) Sulfide 2 Reagent (Cat. No. 1817-32)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

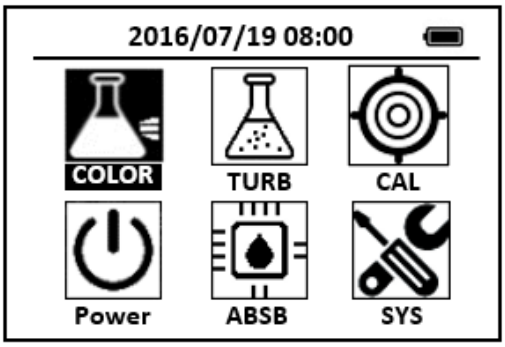

Figure 373

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **S2-** icon.

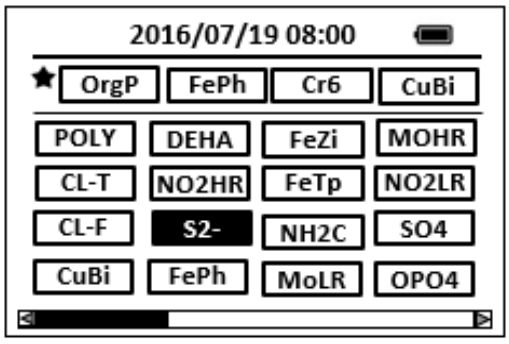

Figure 374

3. Press the OK key to enter **S2-** test program interface.

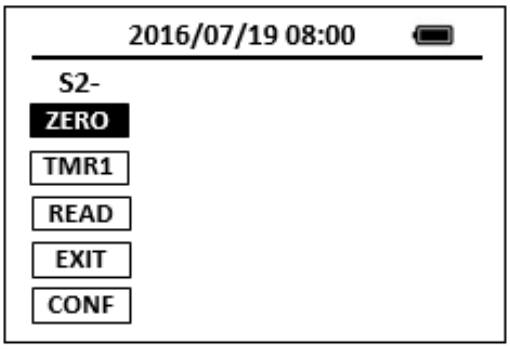

Figure 375

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
   Note: Samples must be analyzed immediately and cannot be preserved for later analysis. Use a pipet to avoid agitation.
6. Add 0.4 ml of one Sulfide 1 Reagent to each sample vial. Cap the vials and invert to mix.
   Note: Use the calibrated 1-ml dropper.
7. Add 0.4 ml of one Sulfide 2 Reagent to each sample vial. Cap the vials and invert to mix.
   Note: A pink color will develop, then the solution will turn blue if sulfide is present.
8. Press the **ZERO** key. Pyxis SP-800 will display the page.

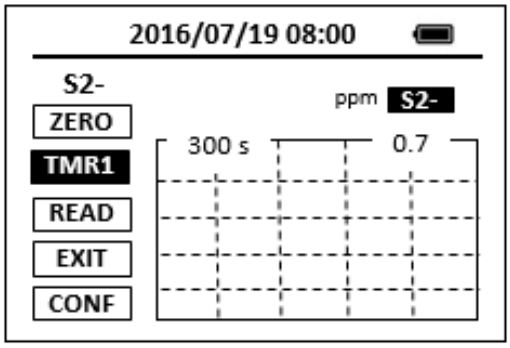

Figure 376

9. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.

13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed.

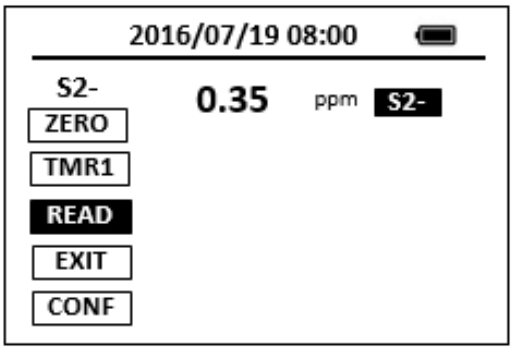

Figure 377

15. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8131

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

72. Silica, High Range - SiHR

Test Program

Description：SP-800 Silica High Range Method (1.0-75.0 ppm SiO2) (Silicomolybdate Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. HACH High Range Silica Reagent Set, 10-mL sample (Cat. No. 24296-00) Includes:
   (1) Molybdate Reagent Powder Pillows for HR Silica (Cat. No. 21073-69)
   (2) Acid Reagent Powder Pillows for High Range Silica (Cat. No. 21074-69)
   (3) Citric Acid Powder Pillows (Cat. No. 21062-69)

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

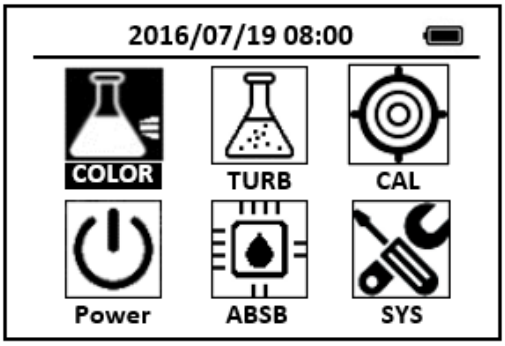

Figure 378

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SiHR** icon.

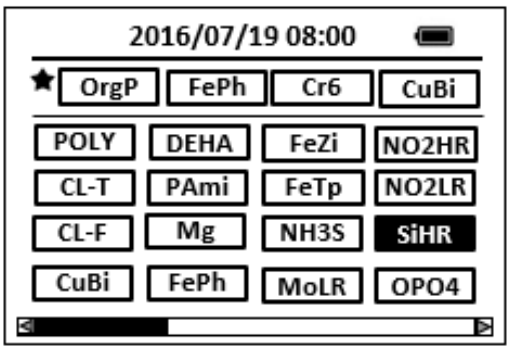

Figure 379

3. Press the OK key to enter **SiHR** test program interface.

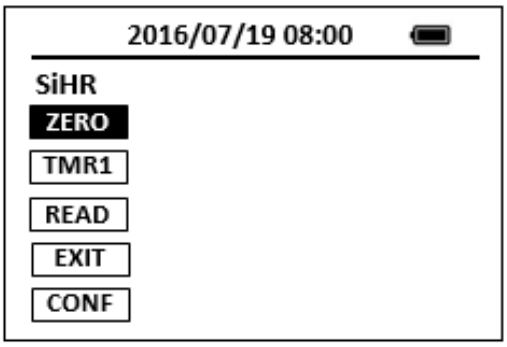

Figure 380

4. Fill two sample vials to the 10-ml line with sample. Set one aside as the blank.
   Note: Sample temperature should be 15 to 25 °C (59 to 77 °F).
5. Add the contents of one Molybdate Reagent Powder Pillow for High Range Silica to the other vial (the prepared sample), Swirl the vial to mix the reagent.
6. Add the contents of one Acid Reagent Powder Pillow for High Range Silica to the prepared sample, Swirl the vial to mix the reagent.
   Note: Silica or phosphate will cause a yellow color to develop.
7. Press the **ZERO** key and Press the **TMR1** key to start the method timer, 10-minute reaction period will begin.

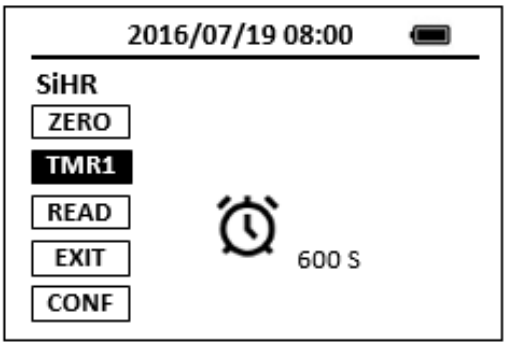

Figure 381

8. Press the **TMR1** key to start the method timer, 10-minute reaction period will begin.
9. After the timer beeps, add the contents of one Citric Acid Powder Pillow to the prepared sample, Swirl the vial to mix the reagent.
   Note: The yellow color due to phosphate will disappear.
10. Press the **TMR2** key to start the method timer, 2-minute reaction period will begin.
    Note: Perform Steps 9-14 within three minutes after the timer beeps

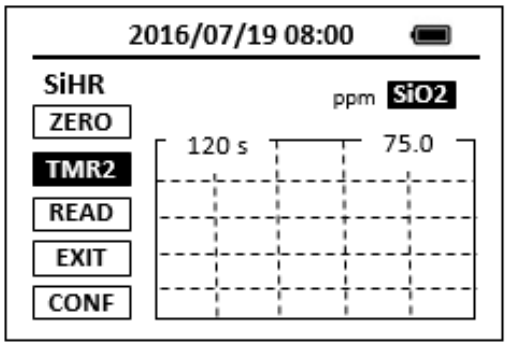

Figure 382

11. After the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. A new concentration value based on the last absorbance value measured will be calculated and displayed.

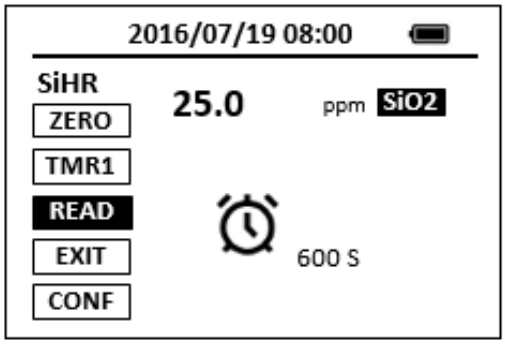

Figure 383

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8185

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*

4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

73. Silica, Low Range - SiLR

Test Program

Description：SP-800 Silica Low Range Method (0.02-5.0 ppm SiO2) (Heteropoly Blue Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Low Range Silica Reagent Set (Cat. No. 24593-00)
   Includes:
   (1) Amino Acid F Reagent Powder Pillows (Cat. No. 22540-69)
   (2) Citric Acid Powder Pillows (Cat. No. 21062-69)
   (3) Molybdate 3 Reagent (Cat. No. 1995-26)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

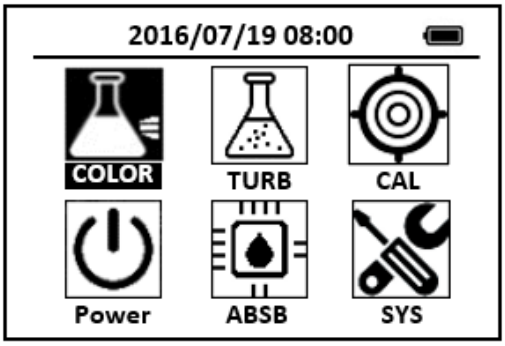

Figure 384

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SiLR** icon.

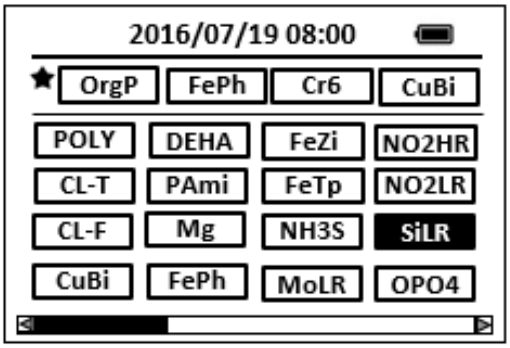

Figure 385

3. Press the OK key to enter **SiLR** test program interface.

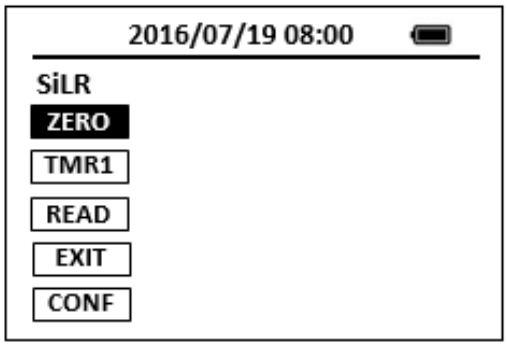

Figure 386

4. Fill two sample vials to the 10-ml line with sample.
5. Add 15 drops of Molybdate 3 Reagent to each sample vial, Swirl the vial to mix the reagent.
   Note: Note: For greatest accuracy, hold dropping bottle vertical.
6. Press the **ZERO** key and Press the **TMR1** key to start the method timer, 4-minute reaction period will begin.
   Note: Reaction time given is for samples at 20 °C (68 °F). If the sample temperature is 10 °C (50 °F), wait 8 minutes. If the sample temperature is 30 °C (86 °F), wait 2 minutes.

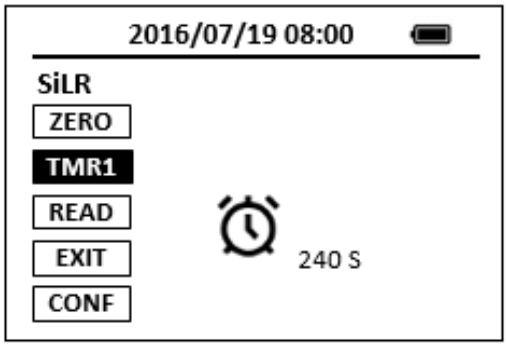

Figure 387

7. After the timer beeps, add the contents of one Citric Acid Reagent Powder Pillow to each sample vial, Swirl the vial to mix the reagent.
8. Press the **TMR2** key to start the method timer, 1-minute reaction period will begin. Phosphate interference is eliminated during this period.
   Note: Reaction time given is for samples at 20 °C (68 °F). If the sample temperature is 10 °C (50 °F), wait 2 minutes. If the sample temperature is 30 °C (86 °F), wait 30 seconds.

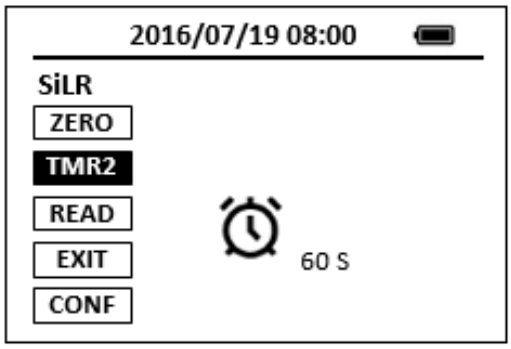

Figure 388

After the timer beeps, add the contents of one Amino Acid F Reagent Powder Pillow to one of the sample vials (the prepared sample), invert to mix.

Note: The sample vial without the Amino Acid F Reagent is the blank.

9. Press the **TMR3** key to start the method timer, 2-minute reaction period will begin.

   Note: A blue color will develop if silica is present.

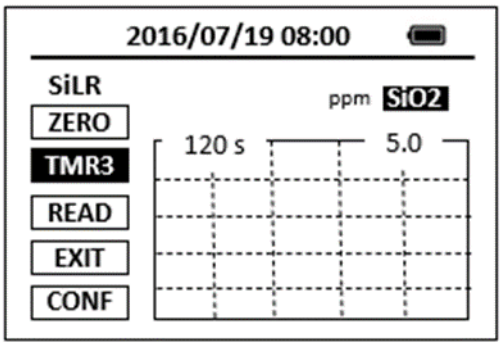

Figure 389

10. After the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. Concentration value based on the last absorbance value measured will be calculated and displayed.

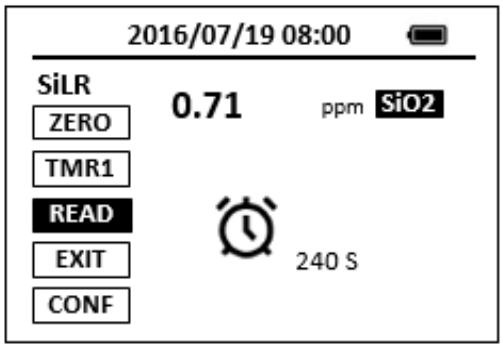

Figure 390

15. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8186

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

74. Sulfite, Low Range - SO3LI

Test Program

Description：SP-800 Sulfite Low Range Method (0.5-5.0 ppm Sulfi) (Iodimetry Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis SO3LI Reagent (PN:30604)
   Includes:
   (1) SO3LI-1
   (2) SO3LI-2

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. On the main page, the screen will display eight major feature groups.

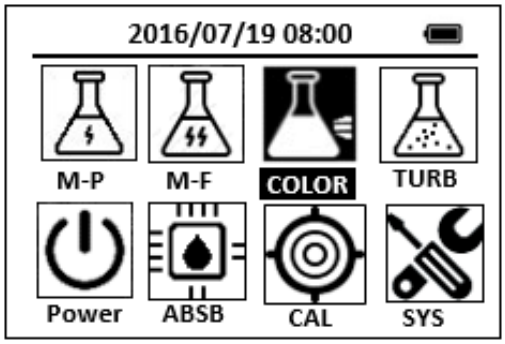

Figure 391

2. Position the cursor to COLOR icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SO3LI** icon.

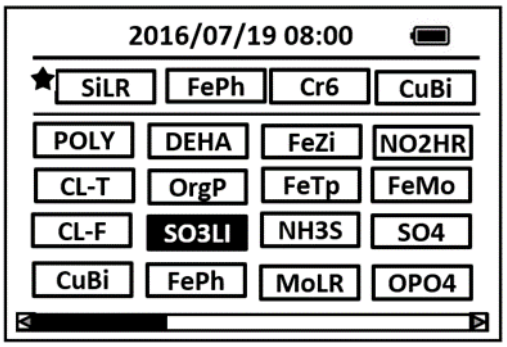

Figure 392

3. Press the OK key to enter **SO3LI** test program interface.

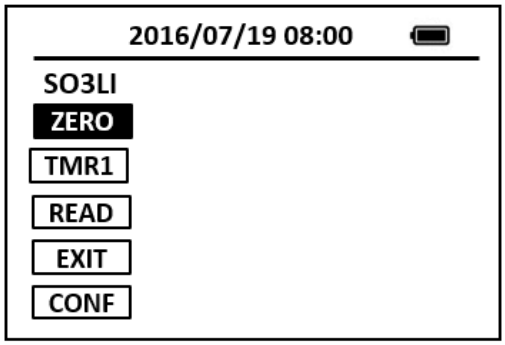

Figure 393

4. Fill a sample vial to the 10-ml line with deionized water (the blank sample).
5. Fill a sample vial to the 10-ml line with sample (the prepared sample).
6. Add 1.0 ml of SO3LI-1 Reagent to each sample vial. Cap the vials and invert to mix.
7. Add 2 drops of SO3LI-2 Reagent to each sample vial. Cap the vials and invert to mix.
8. Press the **ZERO** key. Pyxis SP-800 will display the page.

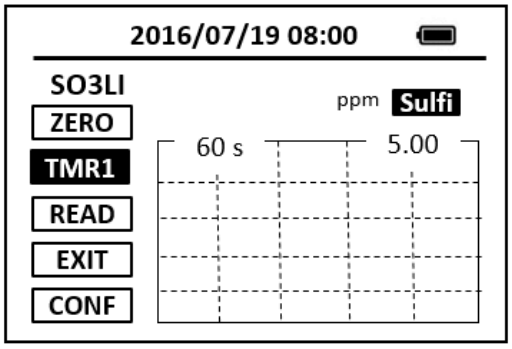

Figure 394

9. Press the **TMR1** key to start the method timer, a 1-minute reaction period will begin.
10. When the timer reaches the preset time and the reaction is complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
14. A new concentration value based on the last absorbance value measured will be calculated and displayed.

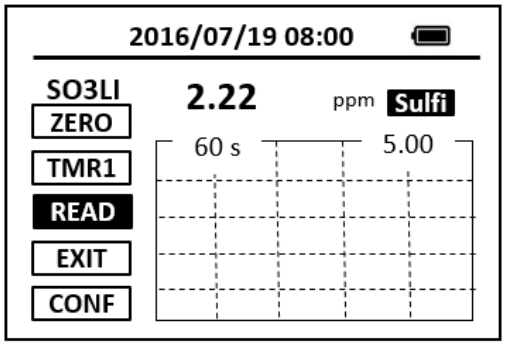

Figure 395

15. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

75. Sulfite, Low Range - SO3LR

Test Program

Description：SP-800 Sulfite Low Range Method (0.1-5.0 ppm SO3) (OPA Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis SO3LR Reagent (PN: 31089)
   (1) SO3LR -1
   (2) SO3LR-2
   (3) SO3LR-3

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

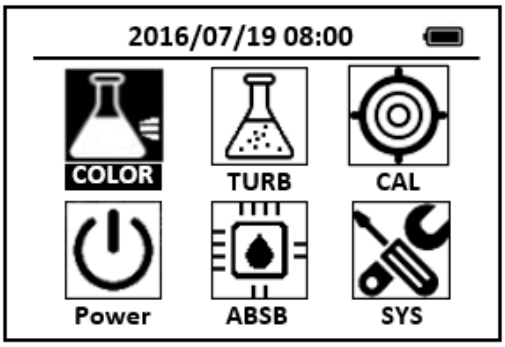

Figure 396

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SO3LR** icon.

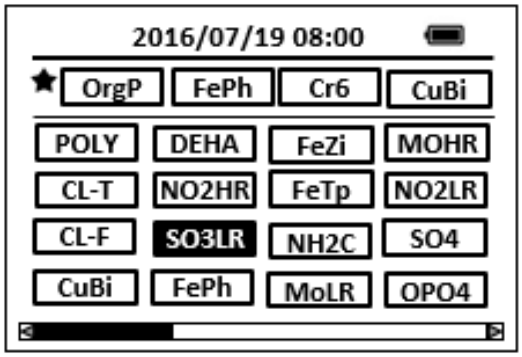

Figure 397

3. Press the OK key to enter **SO3LR** test program interface.

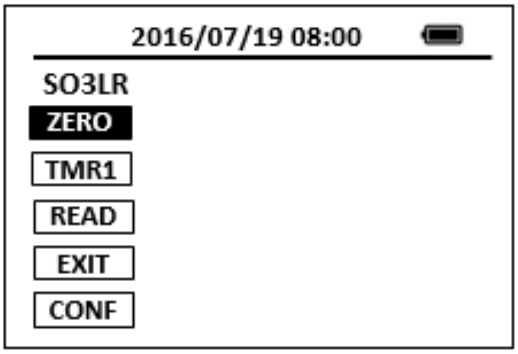

Figure 398

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

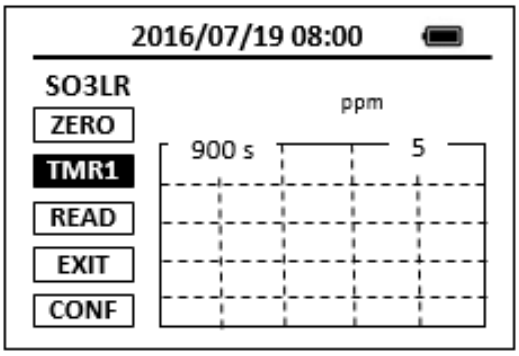

Figure 399

6. Take the sample vial out and add the contents of one SO3LR-1 reagent to the sample vial. Swirl the vial to mix the reagent.
7. Add 1 ml of SO3LR-2 reagent to the sample vial. Cap the vials and invert to mix.
8. Add 1 ml of SO3LR-3 reagent to the sample vial. Cap the vials and invert to mix.
9. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
10. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
11. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

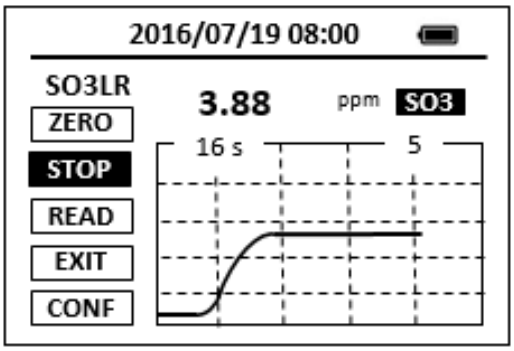

Figure 400

12. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

76. Sulfite, High Range - SO3HR

Test Program

Description：SP-800 Sulfite High Range Method (5.0-50.0 ppm SO3) (OPA Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Pyxis SO3HR Reagent (PN: 31090)
   (1) SO3HR -1
   (2) SO3HR-2
   (3) SO3HR-3

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

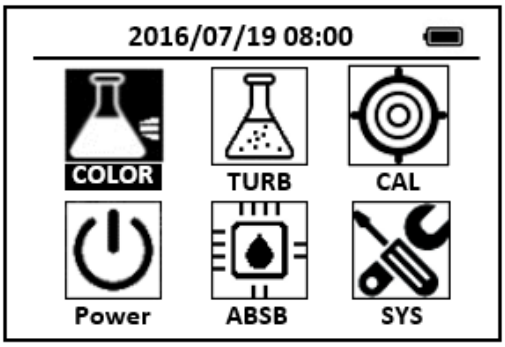

Figure 401

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SO3HR** icon.

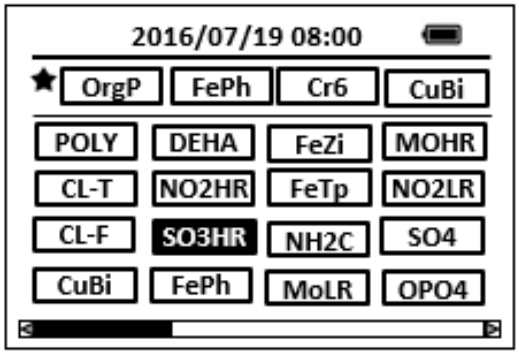

Figure 402

3. Press the OK key to enter **SO3HR** test program interface.

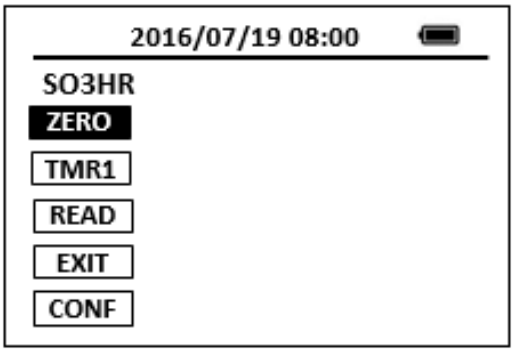

Figure 403

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

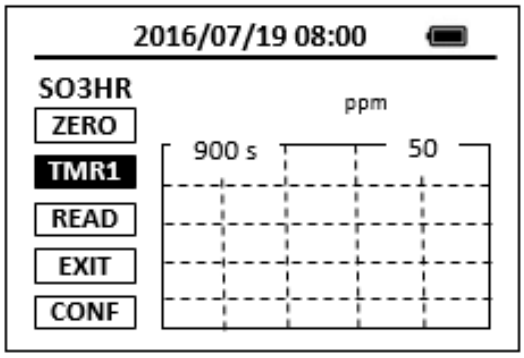

Figure 404

6. Take the sample vial out and add the contents of one SO3HR-1 reagent to the sample vial. Swirl the vial to mix the reagent.
7. Add 1 ml of SO3HR-2 reagent to the sample vial. Cap the vials and invert to mix.
8. Add 1 ml of SO3HR-3 reagent to the sample vial. Cap the vials and invert to mix.
9. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 15-minute reaction period will begin.
10. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water
    sample. The concentration is shown in the chart as a function of time
11. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

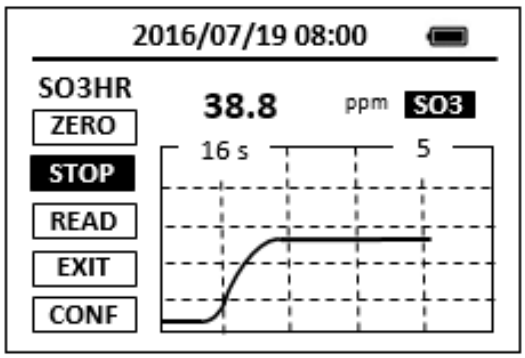

Figure 405

12. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

77. Sulfate - SO4

Test Program

Description：SP-800 Sulfate Method (4.9-70.0 ppm SO4) (Turbidimetric Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. Hach SulfaVer 4 Sulfate Reagent Powder Pillows (Cat. No. 21067-69*)*

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

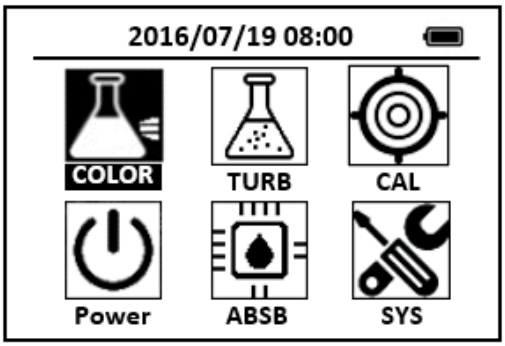

Figure 406

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **SO4** icon.

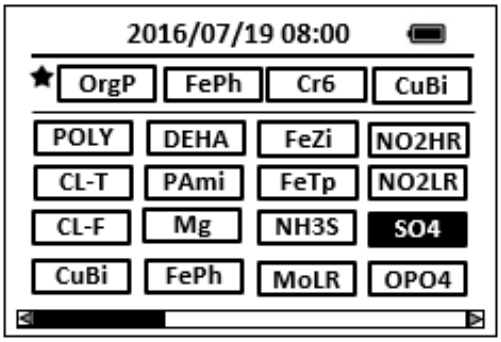

Figure 407

3. Press the OK key to enter **SO4** test program interface.

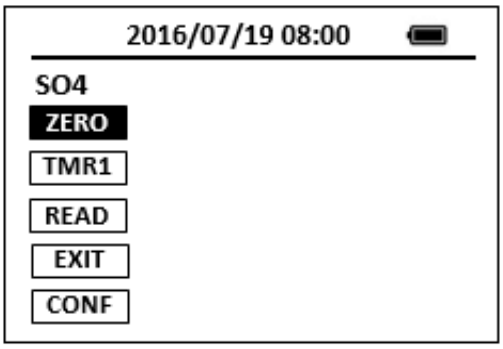

Figure 408

4. Fill a sample vial to the 10-ml line with sample (the blank sample).
5. Use a soft cloth or lint free paper tissue to clean the sample vial. Place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

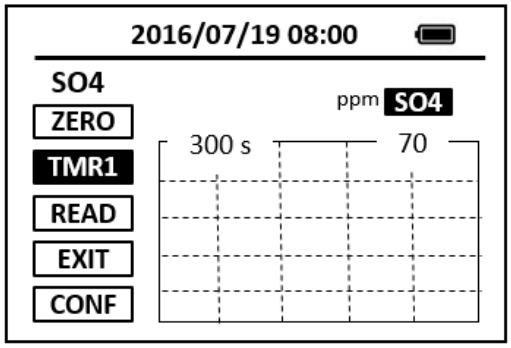

Figure 409

6. Take the sample vial out and add the contents of one SulfaVer 4 Sulfate Reagent Powder Pillow to the sample vial. Swirl the vial to mix the reagent.
   Note: A white turbidity will develop if sulfate is present in the sample.
   Note: Accuracy is not affected by undissolved powder.
7. Place sample vial back into the sample vial compartment and Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.
8. Pyxis SP-800 will start to monitor the reaction between the reagent and the species you want to measure in the water sample. The concentration is shown in the chart as a function of time
9. When the timer reaches the preset time and the reaction is complete, the value of concentration will be shown on the page.

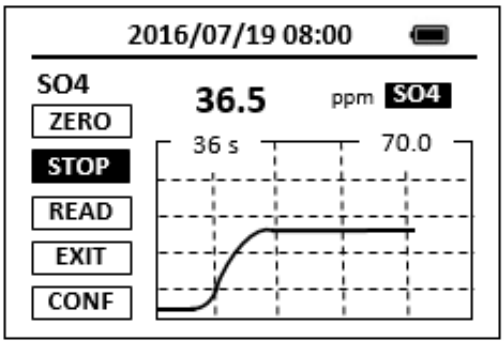

Figure 410

10. The rate of the reaction is often faster than the standard pre-set time, which will become apparent from the concentration-time plot. You can press the **STOP** key to stop the timer and terminate the timing step. The last read concentration value will be displayed on the page after you terminate the timing step.

The method is compatible with HACH 8051

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

78. Total Organic Carbon – TOC

Test Program

Description：SP-800 TOC Method (0.3-20 ppm C) (Direct Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. Blender, 120 V, 14 speed/ Blender, 240 V, 14 speed
4. COD/TNT adapter
5. Cylinder, graduated, 10-mL
6. Flask, Erlenmeyer, 50-mL
7. Magnetic stirrer
8. Paper, pH
9. Pipet , TenSette®, 0.1- to 1.0-mL, with pipet tips
10. Pipet, TenSette®, 1.0- to 10.0-mL, with pipet tips
11. Stir bar, magnetic
12. Test tube rack
13. Water, organic-free
14. Wipes, disposable
15. HACH Total Organic Carbon Direct Method Low Range Test 'N Tube Reagent Set (Cat. No. 2760345)
    - Acid Digestion Solution Vials, Low Range TOC (not sold separately)
    - Buffer Solution, Sulfate (not sold separately; see alternate size below) (Cat. No. 45233)
    - Funnel, micro, poly (Cat. No. 2584335)
    - Indicator Ampule, Low Range TOC (not sold separately)
    - TOC Persulfate Powder Pillows (not sold separately)

Program:

Sample collection

- Collect samples in clean glass bottles.
- Homogenize samples that contain solids to get a representative sample.
- Rinse the sample bottle several times with the sample to be collected.
- Fill the bottle completely full, then tighten the cap on the bottle.
- Analyze the samples as soon as possible for best results.
- Acid preservation is not recommended.

1. Turn on the RD-800 Reactor. Preheat to 105 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature

applications.

2. Add 10 mL of sample to a 50-mL Erlenmeyer flask. Put the stir bar in the Erlenmeyer flask.
3. Add 0.4 mL of Buffer Solution to the Erlenmeyer flask, pH 2.0. Use pH paper to make sure that the sample pH is 2.
4. Put the flask on a stir plate. Stir at a moderate speed for 10 minutes.
5. Put a label that says "Reagent Blank" on one Low Range Acid Digestion vial. Put a lable that says "Sample" on a second Low Range Acid Digestion vial. Add the contents of one TOC Persulfate Powder Pillow to each Acid Digestion Vial.
6. Add 3.0 mL of organic-free water to the blank vial.
7. Add 3.0 mL of sample from the Erlenmeyer flask to the sample vial.
8. Use deionized water to rinse two blue Low Range Indicator Ampules. Clean the ampules with a wipe. Do not touch the sides of the ampules after they are clean. Hold the ampules by the top.
9. Put one unopened ampule into each Acid Digestion Vial. Snap the top off of the ampule when the score aligns with the top of the vial. Let the ampules drop into the vials.

   Note: Do not invert or tilt the vials after the ampule is inside.
10. Close the vials tightly. Insert them into the reactor.
11. Close the reactor. Let the vials react for 2 hours at 103 to 105 °C.
12. After two hours, remove the vials from the reactor. Put them in a test tube rack
    to cool for one hour. Make sure that the vials stay in an upright position at all times . The liquid in the blank should show a dark blue color.
13. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

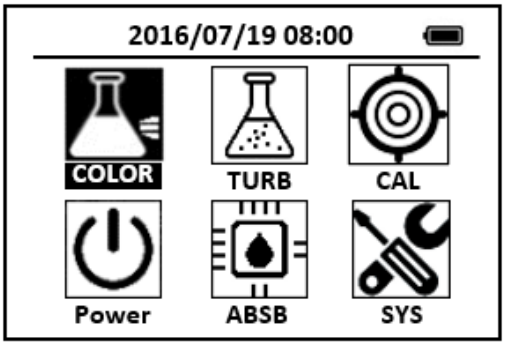

Figure 411

14. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **T0C** icon.

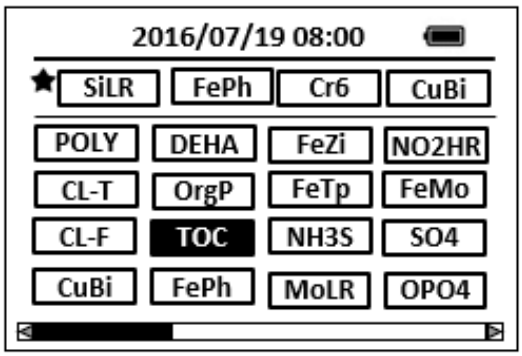

Figure 412

15. Press the OK key to enter **TOC** test program interface.

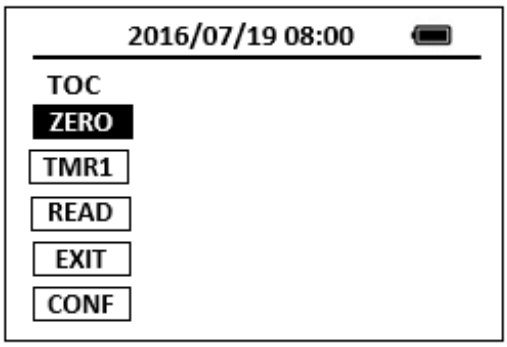

Figure 413

16. Insert the COD/TNT adapter into the vial holder. Then push down to fully insert it.
    Note: For increased performance, a diffuser band covers the light path holes on the adapter. Do not remove the diffuser band.
17. Clean the outside of the blank with a towel.
    Note: Wiping with a damp towel, followed by a dry one, will remove fingerprints or other marks.
18. Place the blank in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.
19. Tightly cover the vial with the instrument cap.
    Note: The blank is stable when stored in the dark.
20. press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

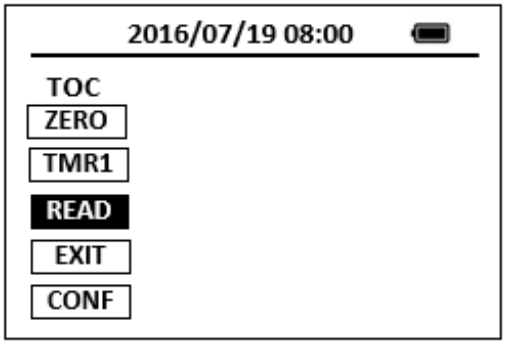

Figure 414

21. Clean the outside of the sample vial with a towel.
22. Place the sample vial in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
    Note: Do not move the vial from side to side as this can cause errors.
23. Tightly cover the vial with the instrument cap and press the **READ** key.
24. Concentration value based on the last absorbance value measured will be calculated and displayed.

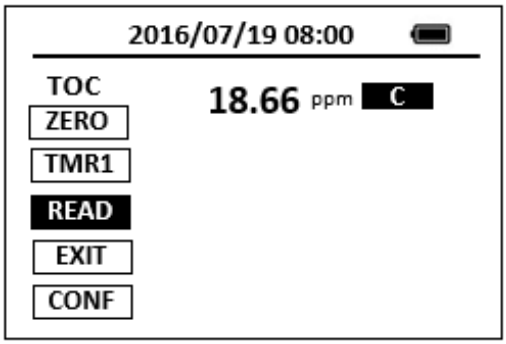

Figure 415

25. Press EXIT key to return to the main page.

The method is compatible with HACH 10129

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-Key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

79. Urea (Reactor Digestion Method) - Urea

Test Program

Description：SP-800 Urea Method (0.5-10.0 ppm) (Antipyrine Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. Pyxis RD-800 Reactor
3. COD/TNT adapter
4. Pyxis Urea Reagent (PN: 31081)
   Includes:
   (1) Urea-1
   (2) Urea-2

Program:

1. Turn on the RD-800 Reactor. Preheat to 105 °C.
   Note: See RD-800 user manual for selecting pre-programmed temperature applications.
2. Take out two digestion vials and remove the caps. Add 5ml of sample to one vial (the sample). Add 5 ml of deionized water to the other vial (the blank).
3. Using a funnel, add the contents of one Urea-1 reagent to each vial. Swirl the vial to mix the reagent.
4. Using a funnel, add the contents of one Urea-2 reagent to each vial. Swirl the vial to mix the reagent.
5. Cap the vials tightly and shake thoroughly to dissolve the powder.
6. Place the vial in the preheated DRB 200 Reactor. Heat the vials for 30 minutes.
7. When the timer reaches the present time, Turn the reactor off.
8. Invert each vial several times while still warm. Place the vials under water 2 minutes until the vials have cooled to room temperature.

Colorimetric Determination:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

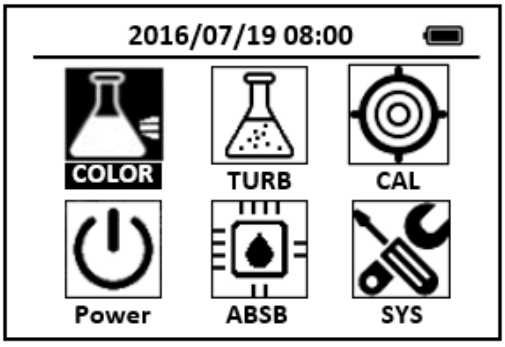

Figure 416

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Urea** icon.

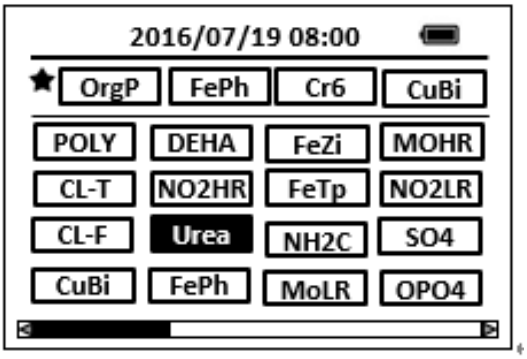

Figure 417

3. Press the OK key to enter Urea test program interface.

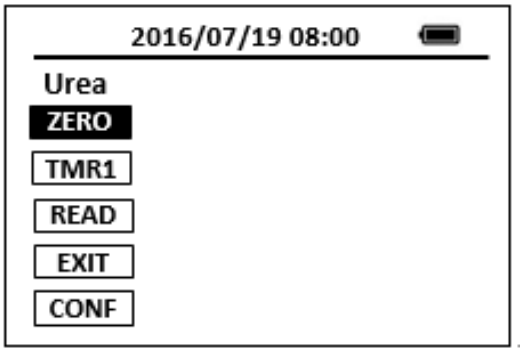

Figure 418

4. Insert the COD/TNT adapter into the vial holder until it drops into place. Then push down to fully insert it.
5. Clean the outside of the blank with a towel.
6. Place the blank in the adapter. Push straight down on the top of the vial until it seats solidly into the adapter.
   Note: Do not move the vial from side to side as this can cause errors.
7. Tightly cover the vial with the instrument cap.
8. Press the **ZERO** key to zero the instrument. Pyxis SP-800 will display the page.

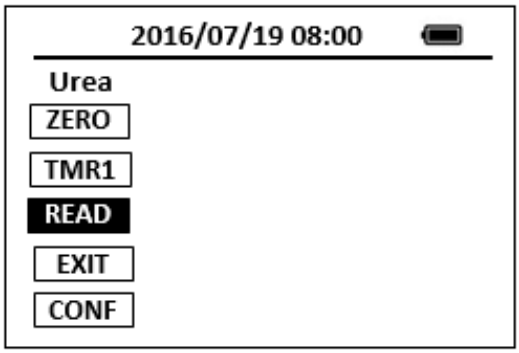

Figure 419

9. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
10. A new concentration value based on the last absorbance value measured will be calculated and displayed. Pyxis SP-800 will display the page.

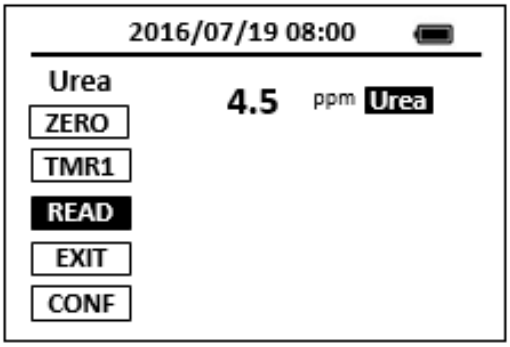

Figure 420

11. Press **EXIT** key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

80. Zinc - ZnXO

Test Program

Description：SP-800 Zinc Method (0.2-3.0 ppm Zn) (Xylenol orange method Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml sample Vial
4. Pyxis ZnXO Reagent(PN: 31052)
   Includes:
   (1) ZnXO -1
   (2) ZnXO -2

Program:

1. Press OK key (the center Key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

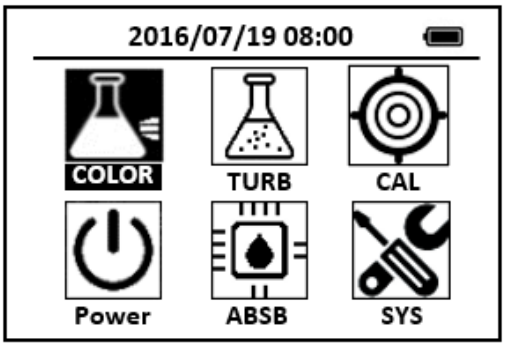

Figure 421

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **ZnXO** icon.

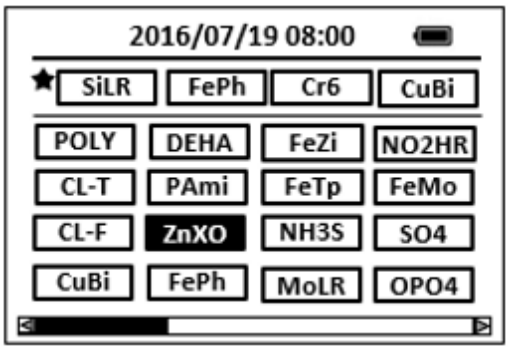

Figure 422

3. Press the OK key to enter **ZnXO** test program interface.

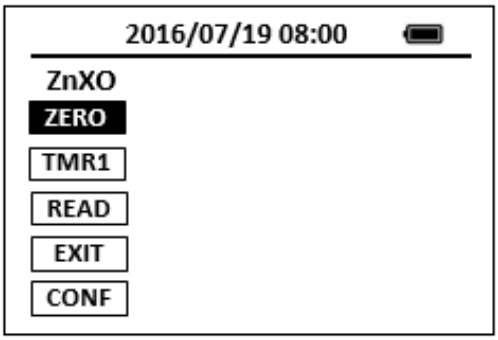

Figure 423

4. Fill a 25-ml sample vial with 25 ml of sample.
   Note: Rinse glassware with 1:1 hydrochloric acid and deionized water before use.
5. Add the contents of one ZnXO-1 reagent powder pillow. Invert several times to completely dissolve the powder.
6. Measure 10 ml of the solution into 10-ml sample vial as the prepared sample.
   Note: There is 15 ml remaining solution in the 25-ml sample vial.
7. Measure 10 ml of the remain solution into another 10-ml sample vial, add one ZnXO-2 to the sample vial as the blank sample. Invert several times to completely dissolve the powder.
   Note: There is 5 ml remaining solution in the 25-ml sample vial.
8. Press the **ZERO** Key. Pyxis SP-800 will display the page.

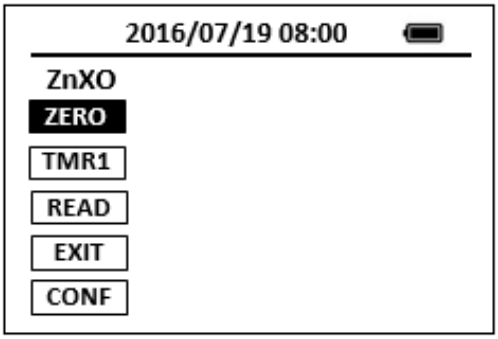

Figure 424

9. Press the **TMR1** key to start the method timer, a 5-minute reaction period will begin.

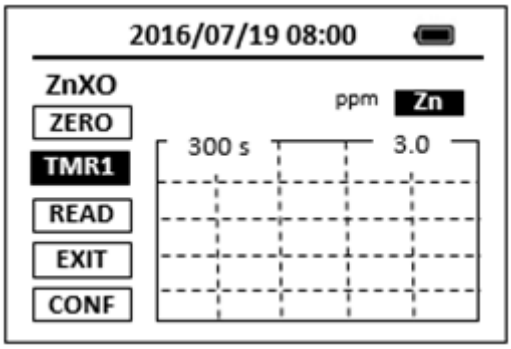

Figure 425

10. When the timer reaches the preset time and the reaction is

complete, the timer beeps, after the timer beeps, the cursor will automatically switch to **EXIT** Key. Press the OK Key to the icon menu-assisted.

11. Use a soft cloth or lint free paper tissue to clean the sample vial.
12. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** Key.
13. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** Key.
14. A new concentration value based on the last absorbance value measured will be calculated and displayed.

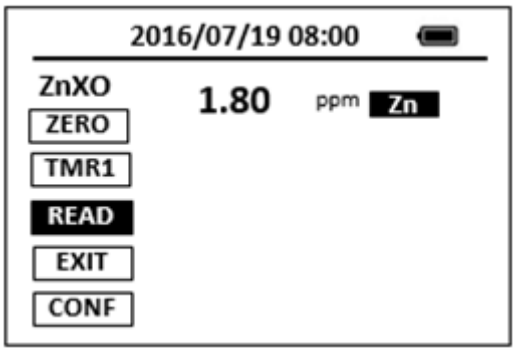

Figure 426

15. Press **EXIT** Key to return to the main page.

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*

81. Zinc - Zn

Test Program

Description：SP-800 Zinc Method (0.02-3.00 ppm Zn) (Zincin Method)

Instruments and Reagents:

1. SP-800 Portable Water Analyzer
2. 10-ml Sample Vial
3. 25-ml Sample Vial
4. HACH Zinc Reagent Set (Cat. No. 24293-00)
   Includes:
   (1) Cyclohexanone (Cat. No. 14033-32)
   (2) ZincoVer 5 Reagent Powder Pillows (Cat. No. 21066-69)

Program:

1. Press OK key (the center key) on the navigation control panel for 3 seconds until the screen lights up. The main page will display six major feature groups.

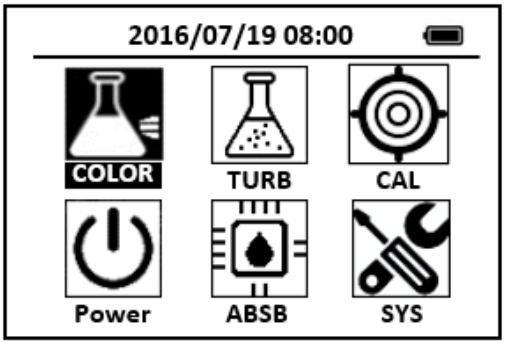

Figure 427

2. Position the cursor to **COLOR** icon by navigation keys and press the OK key to enter COLOR selection interface, position the cursor to **Zn** icon.

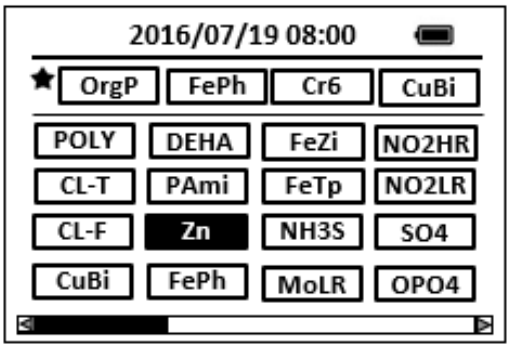

Figure 428

3. Press the OK key to enter **Zn** test program interface.

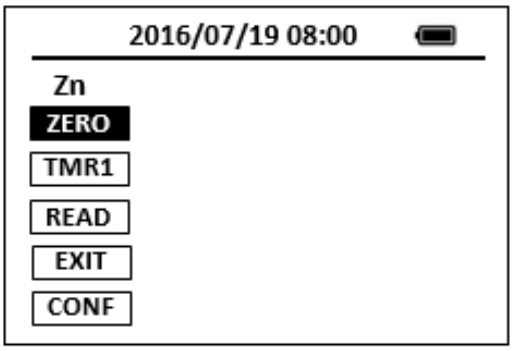

Figure 429

4. Fill a 25-ml sample vial with 20 ml of sample.
   Note: Rinse glassware with 1:1 hydrochloric acid and deionized water before use.
5. Add the contents of one ZincoVer 5 Reagent Powder Pillow. Invert several times to completely dissolve the powder. If the sample does not turn orange, see the note below.
   Note: Powder must be completely dissolved or inconsistent results may occur.
   Note: The sample should be orange. If it is brown or blue, dilute the sample and repeat the test. Either the zinc concentration is too high or an interference is present.

> ***Caution: Zn-1 contains cyanide and is very poisonous if taken internally or inhaled. Do not add to an acidic sample. Store away from water and acids.***

6. Measure 10 ml of the orange solution into 10-ml sample vial (the blank).
7. Add 0.5 ml of cyclohexanone to the remaining orange solution in the 25-ml sample vial (the sample).
   Note: Use a plastic squeezer. Rubber bulbs may contaminate the cyclohexanone.
8. Tightly cap the vial. Shake vigorously for 30 seconds, pour the solution from the 25-ml vial into another 10-ml sample vial (the prepared sample).
   Note: The sample will be red-orange, brown or blue, depending on the zinc concentration.
9. Press the **ZERO** key. Pyxis SP-800 will display the page.

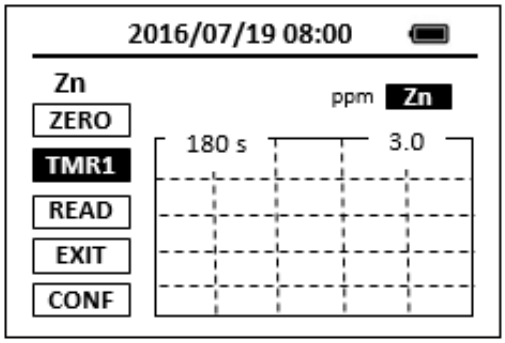

Figure 430

10. Press the **TMR1** key to start the method timer, a 3-minute reaction period will begin.
    Note: Steps 11-14 must be completed within 10 minutes after the timer beeps.
11. When the timer reaches the preset time and the reaction is complete, after the timer beeps, the cursor will automatically switch to **EXIT** key. Press the OK key to the icon menu-assisted.
12. Use a soft cloth or lint free paper tissue to clean the sample vial.
13. Repeat step 2, place the prepared blank into the Pyxis SP-800 sample vial compartment and press the **ZERO** key.
14. Place the prepared sample into the Pyxis SP-800 sample vial compartment and press the **READ** key.
15. Concentration value based on the last absorbance value measured will be calculated and displayed.

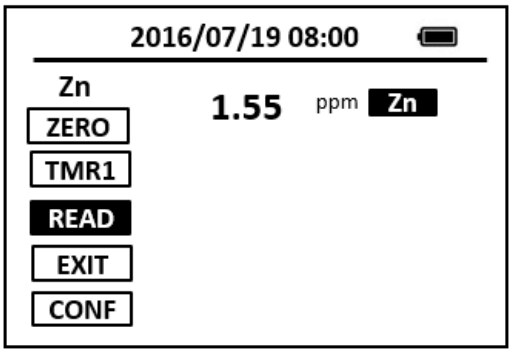

Figure 431

16. Press **EXIT** key to return to the main page.

The method is compatible with HACH 8009

Notes:

1. *The center key is the OK key. Press the OK key on a selected item to launch the action associated with the selected item.*
2. *Rinse all glassware with 1:1 hydrochloric acid solution. Rinse again with deionized water.*
3. *When the sample vial is inserted into the sample vial compartment, the triangular mark on the sample vial should be aligned approximately with the 6 o'clock position of the sample vial compartment or any position consistently.*
4. *Pyxis SP-800 automatically turns itself off after 2 minutes with no-key activity, except for during a measurement. Pressing and holding the OK key for 3 seconds will wake up the instrument, and return to the original page if it has any measurement data.*