General Specifications

PH4/OR4 Sensor Series

pH and ORP Sensors

GS 12B10B00-01EN

■ GENERAL

Yokogawa's line of pH sensors has been strengthened by the inclusion of the polymer electrolyte pH sensor PH4P/PH4PT, HF-resistant pH sensor PH4F/PH4FT, pH sensor for chemical process PH4C /PH4CT, and pH sensor for fermentation PH4FE. Like the pH sensor series, the ORP sensor series is also offered as a complete lineup with the polymer electrolyte ORP sensor OR4P, ORP sensors for chemical process OR4C in addition to standard Ryton pH/ORP sensors.

PH4P Polymer Electrolyte pH Sensor

OR4C ORP sensor for Chemical Process

■ FEATURES

Polymer Electrolyte pH Sensor PH4P, PH4PT, OR4P
• Allows pH/ORP measurement under severe conditions, such as where the process fluid is heavily contaminated or contains sulfide ion.
• With polymer used as the inner solution, the liquid junction is large (around 1.0 mm), and there are 2 single pores, which prevent clogging.
• pH sensor with RTD (resistance temperature detector) PH4PT is also available.

HF-Resistant pH Sensor PH4F, PH4FT
• The special sensing membrane allows measurement of solutions or drainage containing hydrofluoric acid.
• With polymer used as the inner solution, the liquid junction is large (around 1.0 mm), and there are 2 single pores, which prevent clogging.
• pH sensor with RTD PH4FT is also available.

pH/ORP sensor for Chemical Process PH4C, PH4CT, OR4C
• Extremely long life span for pH measurement in electrolytic process.
• With the pressurized inner solution, a pressure holder is not needed.
• pH sensors with RTD, PH4CT is also available.
• The reference electrode is composed of silver ion trap which inhibits the generation of sulfide around the ceramic liquid junction.

pH sensor for Fermentation PH4FE
• Inner solution can be refilled.
• There are 3 of ceramic liquid junctions.
• The reference electrode is composed of silver ion trap which inhibits the generation of sulfide around the ceramic liquid junction.

■ SYSTEM CONFIGURATION

● **Selection of pH sensor**

Application \ pH sensor	PH4P PH4PT	PH4F PH4FT	PH4C PH4CT	PH4FE
General purpose *1	—	—	—	—
Contaminated solutions	R	N	N	N
Solutions containing sulfide ion	R	N	L	L
Electrolytic process solutions	N	N	R	N
Solutions containing organic solvents	L	N	R	R
Waste water containing hydrofluoric acid *2	N	R	N	N
Fermentation (sterilization process)	N	N	N	R

R: Recommended, L: Limited, N: Not Applicable

*1:   Refer to GS 12B07B02-E
*2:   Confirm the specifications of hydrofluoric acid concentration upper limit.
Note: This table above is just for reference. Consult sales personnel about selection of pH sensor.

● **Selection of ORP sensor**

Application \ ORP sensor		OR4P Platinum	OR4C Platinum
General purpose *1		—	—
Drainage treatment	Cyanogen treatment	N	N
	Chrome treatment	N	N
Contaminated solutions *2		L	L
Solutions containing sulfide ion		R	L
Electrolytic process solutions		N	R

R: Recommended, L: Limited, N: Not Applicable

*1:   Refer to GS 12B07B02-E
*2:   If contaminations are easy to precipitate on OR4P's platinum wire, select OR4C with platinum ring.
Note: This table above is just for reference. Consult sales personnel about selection of pH sensor.

● **Relevant models**

Equipment	Model	Model name	Referential GS
Holder	PH8HS	Submersion type holder	GS 12J05C02-00E
	PH8HF	Flow-through type holder	
Adapter	—	(Option code)	—
	SA405	Adapter with temperature sensor	—
Transmitter	FLXA202	2-Wire Analyzer	GS 12A01A03-01EN
	FLXA21	2-Wire Analyzer	GS 12A01A02-01E
	FLXA402	4-Wire Converter	GS 12A01F01-01EN
	FLXA402T	Liquid Analyzer for Turbidity and Chlorine	GS 12F05B10-01EN, GS 12E01B30-01EN, GS 12E04B40-01EN
Terminal box	WTB10	Terminal box	GS 12B07B02-E
Distributor	PH201G	Distributor	—
	VJA1, MA1, etc.	Distributor	GS 77J01A01-01E, GS 77J04A01-01E
Accessories	PH8AX	Accessories for pH meter	GS 12B07B02-E
	OR8AX	Accessories for ORP meter	

■ SPECIFICATIONS

		PH4P	PH4PT	OR4P	PH4F	PH4FT	PH4C	PH4CT	OR4C	PH4FE
Measuring range		pH 2 to 14		-1500 to +1500 mV	pH 2 to 11 *1		pH 0 to 14		-1500 to +1500 mV	pH 0 to 12
Measuring temperature *2		0 to 110°C			0 to 80°C		0 to 100°C			0 to 105°C (Sterilization temperature: maximum 130°C)
Measuring pressure *2		Atmospheric pressure to 1.6MPa (Temperature 25°C) Atmospheric pressure to 600kPa (Temperature 100°C)					Atmospheric pressure to 250kPa *3			Atmospheric pressure to 600kPa
Inner solution in reference electrode		Polymer electrolyte including KCl *4					High viscosity gel including KCl			Viscous 3M KCl-LR
Silver ion trap in reference electrode		None					Available			
Diaphragm		Open junction x 2					Ceramic junction x 1			Ceramic junction x 3
Liquid earth		None								
RTD (Temperature element)		None *5, *6	Pt1000	None	None *5, *6	Pt1000	None *5, *6	Pt1000	None	None *5
Insertion Length		120 mm								120, 200 mm *7
Glass tube diameter		12 mm								
Wetted part material	**Body**	glass	glass, platinum	glass			glass, ceramic		glass, ceramic, platinum	glass, ceramic
	O-ring *8	Fluororubber (FPM)					Ethylene Propylene Diene Rubber (EPDM)			—
	Adapter	Stainless steel (SUS316) (option code: /S3), Polypropylene (option code: /PP) or Rigid polyvinyl chloride (option code: /PV)					Stainless steel (SUS316) (option code: /S3), Polypropylene (option code: /PP), Rigid polyvinyl chloride (option code: /PV), Heat-resistant Vinyl Chloride (option code: /HPV) or titanium (option code: /TN)			—
ORP element		—		Pt (Wire)	—				Pt (Ring)	—
Head form		S8	VP6	S8	S8	VP6	S8	VP6	S8	S7
Cable		S8/S7	VP6	S8/S7		VP6	S8/S7	VP6	S8/S7	
Cable jacket material		Polyvinyl Chloride (PVC)								
Cable measuring temperature		-20 to 70°C	-30 to 70°C	-20 to 70°C		-30 to 70°C	-20 to 70°C	-30 to 70°C	-20 to 70°C	
Applicable holder		Flow-through holder (PH8HF), Submersion holder (PH8HS) *9								*10

Note: Above sensors cannot be used outdoors or with a guide pipe holder.
Installation from lower position or a horizontal position is not possible. Install to the vertical position of more than 15 degrees against the horizontal portion.

*1: The upper limitation of hydrofluoric concentration is as below
   pH 2   Maximum 500 ppm
   pH 3   Maximum 1000 ppm
   pH 4   Maximum 10000 ppm
   Over pH 5 No upper limitation
*2: See Table 1 when using with holder (excluding PH4FE)
*3: PH4C, PH4CT and OR4C are subject to restriction of the inner pressure which remains in the sensor
*4: When used in solution contains organic solvents, Polymer may be eroded and cannot be used for long term.
*5: Select manual temperature compensation on the converter or transmitter.
*6: Use adapter with temperature sensor SA405 for application where temperature varies.
*7: Shaft Length in case of PH4FE
*8: Option code "/PF" Perfluoroelastomer (FFKM) can be selected for O-ring material when used pH sensor (excluding PH4FE)
*9: An option adapter is needed, but not needed when using the adapter with temperature sensor SA405.
   Ultrasonic cleaning is not available. Use a holder with jet cleaning equipment when automatic cleaning is necessary.
   Use O-ring covered by Teflon (K9148MR) when using a special holder for electrolytic process for PH4C, PH4CT or OR4C.
*10: PH4FE cannot be used with PH8HF or PH8HS. When a holder is needed, consult sales personnel.

Table 1   Process Temperature Range, Process Pressure Range

Holder Type	Holder Material	Cleaner	Adapter Material	pH/ORP Range	Temperature (°C)	Process Pressure
Submersion (PH8HS)	PP, SUS *2	None	PVC	PH4P, PH4PT: pH 2 to 14	0 to 50	Atmospheric pressure (Submersion depth: Max. 3m)
			PP, SUS *2		0 to 100 *4	
		Provided *3	PVC		0 to 50	
			PP, SUS *2	PH4F, PH4FT: pH 2 to 11	0 to 80	
Flow-through (PH8HF) *1	PP	None, Provided *3	PVC		0 to 50	PH4P, PH4PT, OR4P PH4F, PH4FT:
			PP, SUS *2		0 to 80	
	SUS *2	None	PVC	PH4C, PH4CT: pH 0 to 14	0 to 50	Atmospheric pressure to 500 kPa
			PP		0 to 80	
			SUS *2		0 to 100 *4	
		Provided *3	PP, SUS *2	OR4P, OR4C: -1500 to 1500 mV	0 to 80	PH4C, PH4CT, OR4C *5: Atmospheric pressure to 250 kPa
			PVC		0 to 50	

PVC: Rigid Polyvinyl Chloride, PP: Polypropylene, SUS: Stainless Steel (SUS316)

*1:   For Flow-through types also refer to temperature and pressure diagram of Holder GS 12J05C02-00E.
*2:   Stainless steel holder and stainless steel adapter should be used if the solution is pH 3 more acidmic.
*3:   Only jet cleaning system can be used.
*4:   When PH4F or PH4FT is used, temperature upper limit is 80°C.
*5:   Available measuring pressure decreases when the inner pressure of PH4C, PH4CT or OR4C decreases.

● **Specification for adapter with temperature sensor (SA405)**
Applicable sensors: PH4P, PH4F, PH4C
Temperature sensor: Pt1000
Wetted part (Temperature sensor cover/ Adapter) materials:
                   Hastelloy C / Hastelloy C, Stainless steel (SUS316) / PEEK, Titanium/Titanium
Applicable holder: Flow-through holder (PH8HF), Submersion holder (PH8HS)

■ Compliance with the simple apparatus requirements

PH4/OR4 sensor series meets the simple apparatus requirements defined in the following standards.

Note1: PH4P, PH4PT, OR4P, PH4F, PH4FT, PH4C, PH4CT, OR4C, and PH4FE can be applied as simple apparatus.
Note2: For PH4PT, PH4FT, and PH4CT classification of intrinsic safety, and electrical parameters are approved by TIIS, which is valid in only Japan.

Use the sensors under the conditions of use required by the standards.

Applicable standards:
ANSI/ISA-60079-11 (2014)
ANSI/ISA-60079-0 (2009)
CAN/CSA-C22.2 NO. 60079-11:14
CAN/CSA-C22.2 NO. 60079-0:11
IEC 60079-11
한국 전자파적합성 기준
GB 3836.4-2010

Conditions of use:
(1) Use with an internally isolated transmitter, or use with a transmitter in combination with isolated barrier.
    The FLXA21/202 is internally isolated.
(2) Upper limit of the process temperature.
    The upper limit of process temperature is indicated below when the sensor is used in combination with a YOKOGAWA transmitter.
    For FLXA21/202, model and suffix code below is available.
        FLXA21-D-□-D-◊-P1-○-A-N-LA-N-NN
                □ can be any value.
                ◊ must be EA, CD, CH, or EG
                ○ must be NN or P1.
                Any option code is available.
        FLXA202-D-□-D-◊- P1-○-A-N-LA-N-NN
                □ can be any value.
                ◊ must be CD, CH, or CG
                ○ must be NN or P1.
                Any option code is available.
    For PH202S, model and suffix code below is available.
        PH202S-○-E
                ○ must be C or U.
                There are no PH202S models that meet the Korean explosion proof standards.
                Any option code is available.

Upper limit of process temperature (Ambient temperature : -20°C to +40°C)

Transmitter used in combination	FLXA202/21				PH202S			
Temp. class ⟍ Sensor type	PH4P OR4P	PH4F	PH4C OR4C	PH4FE*	PH4P OR4P	PH4F	PH4C OR4C	PH4FE*
T6	55	55	55	55	75	75	75	75
T5	70	70	70	70	90	80	90	90
T4	105	80	100	105	105	80	100	105
T3	105	80	100	105	105	80	100	105
T2	105	80	100	105	105	80	100	105
T1	105	80	100	105	105	80	100	105

*: Do not use beyond upper limit of process temperature at sterilization.

Transmitter used in combination	FLXA202/221			PH202S		
Temp. class ⟍ Sensor type	PH4PT	PH4FT	PH4CT	PH4PT	PH4FT	PH4CT
T6	NA*	NA*	NA*	22	22	22
T5	65	65	65	82	80	82
T4	100	80	100	110	80	100
T3	100	80	100	110	80	100
T2	100	80	100	110	80	100
T1	100	80	100	110	80	100

*: Not allowed to be installed in T6.

■ MODEL AND SUFFIX CODES

Model	Suffix Code		Option Code	Specifications
PH4P **PH4PT** **PH4F** **PH4FT**	....		....	Polymer Electrolyte pH Sensor *1
				Polymer Electrolyte pH Sensor with RTD *2
				HF-Resistant pH Sensor *1
				HF-Resistant pH Sensor with RTD *2
Insertion Length	**-120**		....	120 mm
Cable Length	**-00**		....	No Cable *3
	-03		....	3 m
	-05		....	5 m
	-10		....	10 m
	-15		....	15 m
	-20		....	20 m
Terminal Type *4		**D**	....	Cable for PH400G (Fork Terminal)
		E	....	Cable for FLXA402, FLXA402T, PH202, FLXA202, FLXA21 (Pin Terminal)
		F	....	Cable for FLXA202, FLXA21 (M4 Ring Terminal)
		G	....	Cable for FLXA402, FLXA402T, PH450G, PH202/TB (M3 Ring Terminal)
		N	....	No Cable *3
—		**-N**	....	Always -N
Option Adapter *5		**/S3**		Stainless Steel (SUS316)
		/PP		Polypropylene
		/PV		Rigid Polyvinyl Chloride
O-Ring		**/PF**		Perfluoroelastomer (FFKM) *6

*1:   PH4P and PH4F can be used with the adapter with temperature sensor SA405.
*2:   TIIS Ex intrinsic safety structure (TIIS Ex approval is valid only in Japan)
*3:   When using sensor only, select cable length -00 and Terminal type N.
*4:   When using Terminal box, refer to Table 2.
*5:   This is needed when using the holder PH8HS or PH8HF. However when PH4P or PH4F is used with the temperature sensor SA405, the option adapter is not needed.
*6:   Select perfluoroelastomer when sensor is used in organic solvent, high alkaline or high temperature alkaline solution.

Table 2 Selection of terminal box

Sensor	RTD	SA405	Terminal Type			
			D	E	F	G
PH4P PH4F PH4C	None	Selected	—	WTB10-PH2	WTB10-PH6	WTB10-PH4
		None	—	WTB10-PH1	WTB10-PH5	WTB10-PH3
PH4PT PH4FT PH4CT	Available	—	—	WTB10-PH1	WTB10-PH5	WTB10-PH3
OR4P OR4C	None	—	—	WTB10-PH1	WTB10-PH5	WTB10-PH3
PH4FE	None	—	—	—	—	—

Note: For combined system with WTB10, maximum cable length including sensor cable length should be within 20 m.

Model	Suffix Code	Option Code	Specifications
OR4P	....	....	Polymer Electrolyte ORP Sensor
Insertion Length	**-120**	....	120 mm
Cable Length	**-00** **-03** **-05** **-10** **-15** **-20**	....	No Cable *1 3 m 5 m 10 m 15 m 20 m
Terminal Type *2	**D** **E** **F** **G** **N**	....	Cable for OR400G (Fork Terminal) Cable for FLXA402, PH202, FLXA202, FLXA21 (Pin Terminal) Cable for FLXA202, FLXA21 (M4 Ring Terminal) Cable for FLXA402, PH450G, PH202/TB (M3 Ring Terminal) No Cable *1
—		**-N**	....	Always -N
Option	Adapter *3	**/S3** **/PP** **/PV**	Stainless Steel (SUS316) Polypropylene Rigid Polyvinyl Chloride

*1:　When using sensor only, select cable length -00 and Terminal type N.
*2:　When using Terminal box, refer to Table 2.
*3:　This is needed when using the holder PH8HS or PH8HF.

Model	Suffix Code	Option Code	Specifications
PH4C **PH4CT**	....	....	pH Sensor for Chemical Process *1 pH Sensor for Chemical Process with RTD *2
Insertion Length	**-120**	....	120 mm
Cable Length	**-00** **-03** **-05** **-10** **-15** **-20**	....	No Cable *3 3 m 5 m 10 m 15 m 20 m
Terminal Type *4	**D** **E** **F** **G** **N**	....	Cable for PH400G (Fork Terminal) Cable for FLXA402, FLXA402T, PH202, FLXA202, FLXA21 (Pin Terminal) Cable for FLXA202, FLXA21 (M4 Ring Terminal) Cable for FLXA402, FLXA402T, PH450G, PH202/TB (M3 Ring Terminal) No Cable *3
—		**-N**	....	Always -N
Option	Adapter *5	**/S3** **/PP** **/PV** **/HPV** **/TN**	Stainless Steel (SUS316) Polypropylene Rigid Polyvinyl Chloride Heat-resistant Vinyl Chloride Titanium
	O-Ring	**/PF**	Perfluoroelastomer (FFKM) *6

*1:　PH4C can be used with the adapter with temperature sensor SA405.
*2:　TIIS Ex intrinsic safety structure (TIIS Ex approval is valid only in Japan)
*3:　When using sensor only, select cable length -00 and Terminal type N.
*4:　When using Terminal box, refer to Table 2.
*5:　This is needed when using the holder PH8HS or PH8HF. However when PH4C is used with the temperature sensor SA405, the option adapter is not needed.
*6:　Select perfluoroelastomer when sensor is used in organic solvent, high alkaline or high temperature alkaline solution.

Model	Suffix Code		Option Code	Specifications
OR4C	....		....	ORP Sensor for Chemical Process
Insertion Length	**-120**		....	120 mm
Cable Length	**-00**		....	No Cable *1
	-03		....	3 m
	-05		....	5 m
	-10		....	10 m
	-15		....	15 m
	-20		....	20 m
Terminal Type *2		**D**	....	Cable for OR400G (Fork Terminal)
		E	....	Cable for FLXA402, PH202, FLXA202, FLXA21 (Pin Terminal)
		F	....	
		G	....	Cable for FLXA202, FLXA21 (M4 Ring Terminal)
		N	....	Cable for FLXA402, PH450G, PH202/TB (M3 Ring Terminal)
				No Cable *1
—			**-N**	....	Always -N
Option	Adapter *3		**/S3**	Stainless Steel (SUS316)
			/PP	Polypropylene
			/PV	Rigid Polyvinyl Chloride
			/HPV	Heat-resistant Vinyl Chloride
			/TN	Titanium

*1: When using sensor only, select cable length -00 and Terminal type N.
*2: When using Terminal box, refer to Table 2.
*3: This is needed when using the holder PH8HS or PH8HF.

Model	Suffix Code		Option Code	Specifications
PH4FE	....		....	pH Sensor for Fermentation
Shaft Length	**-120**		....	120 mm
	-200		....	200 mm
Cable Length	**-00**		....	No Cable *1
	-03		....	3 m
	-05		....	5 m
	-10		....	10 m
	-15		....	15 m
	-20		....	20 m
Terminal Type		**D**	....	Cable for PH400G (Fork Terminal)
		E	....	Cable for FLXA402, FLXA402T, PH202, FLXA202, FLXA21 (Pin Terminal)
		N	....	No Cable *1
—			**-N**	....	Always -N

*1: When using sensor only, select cable length -00 and Terminal type N.

● **Adapter with temperature sensor (SA405)**

Model	Suffix Code		Option Code	Specifications
SA405	....		....	Adapter with temperature sensor
Measuring System	**-A**		....	for PH400G *1
	-E		....	for FLXA402, FLXA402T, PH202/FLXA202/FLXA21 *2
	-F		....	for FLXA202/FLXA21 *4
	-G		....	for FLXA402, FLXA402T, PH450G, PH202/TB *3
Material of Temp. Sensor Cover/ Adapter		**-HC**	....	Hastelloy C / Hastelloy C
		-S3	....	Stainless steel (SUS316) / PEEK
		-TN	....	Titanium / Titanium
Cable Length		**-03**	....	3 m
		-05	....	5 m
		-10	....	10 m

*1: Mark band is shown by alphanumeric and fork terminals are used.
*2: Mark band is shown by numeral and pin terminals are used.
　　When terminal box is used, select WTB10-PH2.
*3: Mark band is shown by numeral and M3 ring terminals are used.
　　When terminal box is used, select WTB10-PH4.
*4: Mark band is shown by numeral and M4 ring terminals are used.
　　When terminal box is used, select WTB10-PH6.

● **Spare Parts**

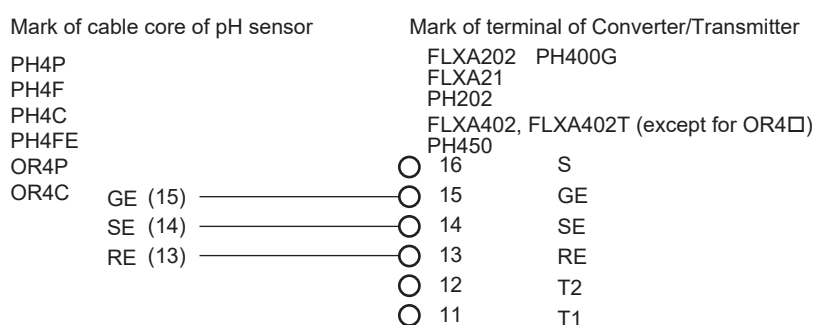| Part Name		Part Number	Remarks
Fork Terminal Cable for PH400G, OR400G Terminal Type: D	3 m	K9691MA	For PH4P, OR4P, PH4F, PH4C, OR4C, PH4FE
	5 m	K9691MB	
	10 m	K9691MC	
	15 m	K9691MD	
	20 m	K9691ME	
	3 m	K9691NA	For PH4PT, PH4FT, PH4CT
	5 m	K9691NB	
	10 m	K9691NC	
	15 m	K9691ND	
	20 m	K9691NE	
Pin Terminal Cable for FLXA402, FLXA402T (except for OR4☐), PH202, FLXA202, FLXA21 Terminal Type: E	3 m	K9691PA	For PH4P, OR4P, PH4F, PH4C, OR4C, PH4FE
	5 m	K9691PB	
	10 m	K9691PC	
	15 m	K9691PD	
	20 m	K9691PE	
	3 m	K9691QA	For PH4PT, PH4FT, PH4CT
	5 m	K9691QB	
	10 m	K9691QC	
	15 m	K9691QD	
	20 m	K9691QE	
M4 Ring Terminal Cable for FLXA202, FLXA21 Terminal Type: F	3 m	K9691RA	For PH4P,OR4P, PH4F, PH4C, OR4C
	5 m	K9691RB	
	10 m	K9691RC	
	15 m	K9691RD	
	20 m	K9691RE	
	3 m	K9691RN	For PH4PT, PH4FT, PH4CT
	5 m	K9691RP	
	10 m	K9691RQ	
	15 m	K9691RR	
	20 m	K9691RS	
M3 Ring Terminal Cable for FLXA402, FLXA402T (except for OR4☐), PH450G, PH202/TB Terminal Type: G	3 m	K9691SA	For PH4P, OR4P, PH4F, PH4C, OR4C
	5 m	K9691SB	
	10 m	K9691SC	
	15 m	K9691SD	
	20 m	K9691SE	
	3 m	K9691SN	For PH4PT, PH4FT, PH4CT
	5 m	K9691SP	
	10 m	K9691SQ	
	15 m	K9691SR	
	20 m	K9691SS	
Adapter	Stainless Steel (SUS316) Option code: /S3	K9148NA	For PH4P, PH4PT, OR4P, PH4F, PH4FT, PH4C, PH4CT, OR4C
	Polypropylene Option code: /PP	K9148NB	
	Rigid Polyvinyl Chloride Option code: /PV	K9148NC	
	Heat-resistant Vinyl Chloride Option code: /HPV	K9148ND	For PH4C, PH4CT, OR4C
	Titanium Option code: /TN	K9148NE	
O-Ring	Perfluoroelastomer (FFKM)	K9319RJ	For PH4P, PH4PT, PH4F, PH4FT, PH4C, PH4CT, Option code: /PF
	Fluororubber (FPM)	K9691KA	For PH4P, PH4PT, OR4P, PH4F, PH4FT
	Ethylene Propylene Diene Rubber (EPDM)	K9691KB	For PH4C, PH4CT, OR4C

Part Name		Part Number	Remarks
Electrolyte	Viscous 3 M KCl-LR	K9691KK	For PH4FE (500mL)
Buffer solution for calibration (pH4)		K9084LL	Six 250 mL polyethylene bottles
Buffer solution for calibration (pH7)		K9084LM	Six 250 mL polyethylene bottles
Buffer solution for calibration (pH9)		K9084LN	Six 250 mL polyethylene bottles
Powder for buffer solution (pH4)		K9020XA	12 bags, each for preparation of 500 mL
Powder for buffer solution (pH7)		K9020XB	12 bags, each for preparation of 500 mL
Powder for buffer solution (pH9)		K9020XC	12 bags, each for preparation of 500 mL
Reagent for ORP check	Quinhydrone	K9024EC	3 bags, each for preparation of 250 mL
	Iron	K9024ED	3 bags, each for preparation of 250 mL

Note: The pH value of the calibrating buffer solution may vary depending on storage conditions.

■ WIRING DIAGRAMS

Mark (alphanumeric / number) of cable core of pH sensor depends on terminal form.

In case of PH4□, PH4FE pH sensor, OR4□ ORP sensor

Mark of cable core of pH sensor

PH4P
PH4F
PH4C
PH4FE
OR4P
OR4C

GE (15)
SE (14)
RE (13)

Mark of terminal of Converter/Transmitter

FLXA202   PH400G
FLXA21
PH202
FLXA402, FLXA402T (except for OR4□)
PH450

16	S
15	GE
14	SE
13	RE
12	T2
11	T1

Note: Since RTD is not available, there is no wire connection to Converter/Transmitter 11 (T1) or 12 (T2).
There is no wire connection to Converter/Transmitter 16 (S).

In case of PH4□T pH sensor with RTD

Mark of cable core of pH sensor

PH4PT
PH4FT
PH4CT

GE (15)
SE (14)
SE (14)
RE (13)
T2 (12)
T1 (11)

Mark of terminal of Converter/Transmitter

FLXA202   PH400G
FLXA21
PH202
FLXA402, FLXA402T (except for OR4□)
PH450

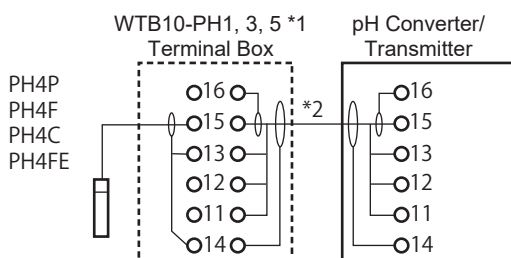| 16 | S |
15	GE
14	SE
13	RE
12	T2
11	T1
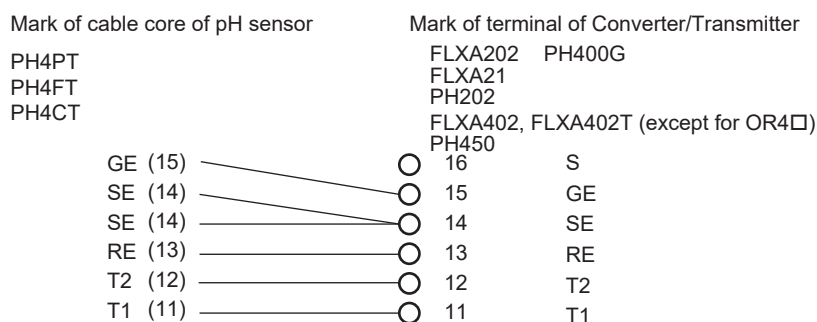
Note: 2 cable cores of pH sensor should be connected to the terminal of Converter/Transmitter 14 (SE).
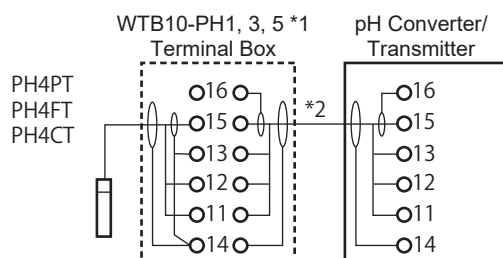There is no wire connection to Converter/Transmitter 16 (S).
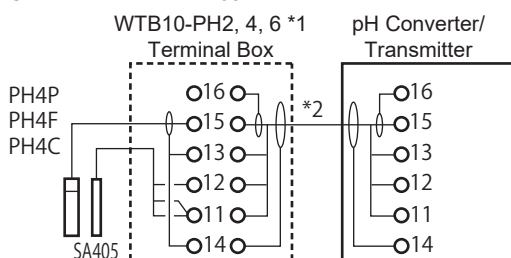
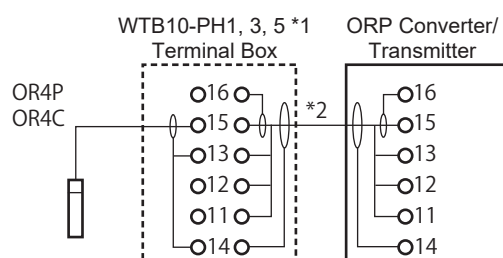**When using Terminal box WTB10**

No combination with SA405

WTB10-PH1, 3, 5 *1
Terminal Box

pH Converter/
Transmitter

PH4P
PH4F
PH4C
PH4FE

○16
○15
○13
○12
○11
○14

*2

○16
○15
○13
○12
○11
○14

pH sensor with RTD

WTB10-PH1, 3, 5 *1
Terminal Box

pH Converter/
Transmitter

PH4PT
PH4FT
PH4CT

○16
○15
○13
○12
○11
○14

*2

○16
○15
○13
○12
○11
○14

Combination with SA405

WTB10-PH2, 4, 6 *1
Terminal Box

pH Converter/
Transmitter

PH4P
PH4F
PH4C

○16
○15
○13
○12
○11
○14

*2

○16
○15
○13
○12
○11
○14

SA405

ORP sensor

WTB10-PH1, 3, 5 *1
Terminal Box

ORP Converter/
Transmitter

OR4P
OR4C

○16
○15
○13
○12
○11
○14

*2

○16
○15
○13
○12
○11
○14

F03.ai

*1: Terminal box is used only where pH/ORP Converter/Transmitter is installed remotely from pH or ORP sensor (normally not needed).
Refer to Table 2 for WTB10 type.

*2: This cable is specified in the option code for the terminal box. For combined system with WTB10, maximum cable length including sensor cable length should be within 20m.
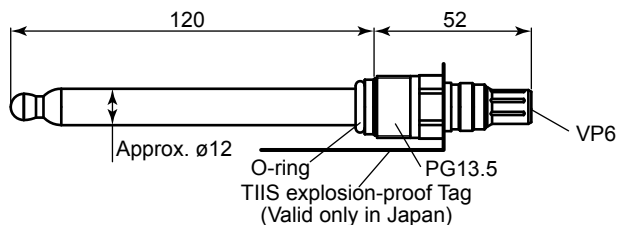
■ DIMENSIONS

PH4P   Polymer Electrolyte pH Sensor
PH4F   HF-Resistant pH Sensor
PH4C   pH Sensor for Chemical Process

Unit: mm

120   32

S8

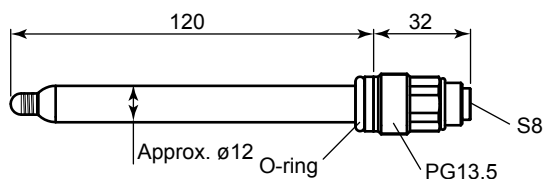Approx. ø12   O-ring

PG13.5
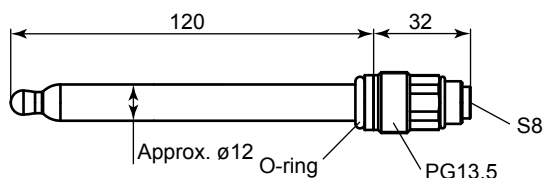
PH4PT   Polymer Electrolyte pH Sensor with RTD
PH4FT   HF-Resistant pH Sensor with RTD
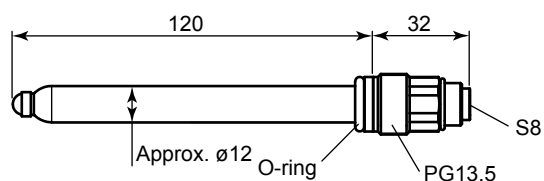**PH4CT   pH Sensor for Chemical Process with RTD**

Unit: mm

120   52

VP6

Approx. ø12

O-ring   PG13.5

TIIS explosion-proof Tag
(Valid only in Japan)

OR4P   Polymer Electrolyte ORP Sensor

Unit: mm

120   32

S8

Approx. ø12   O-ring

PG13.5

OR4C   ORP Sensor for Chemical Process

120   32

Approx. ø12   O-ring
PG13.5
S8

PH4FE   pH Sensor for Fermentation

Unit: mm

L
(L=120, 200)

203

70

31

ø30

Approx. ø12

Electrode solution
(Inner solution)

Inner solution refilling vent

S7
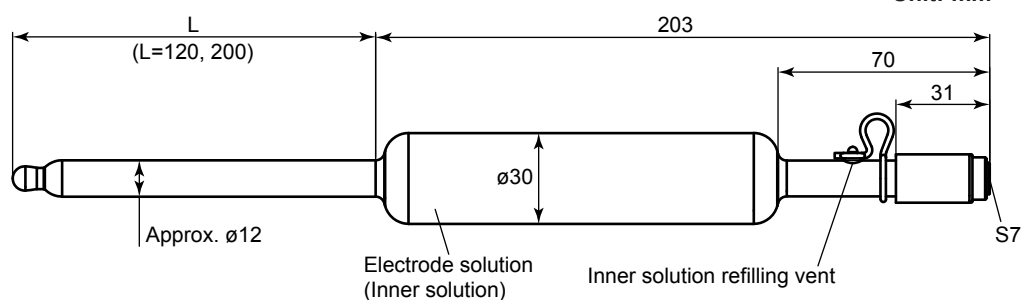
● **Cable**
S8/S7 cable for PH4P, OR4P, PH4F, PH4C, OR4C, PH4FE

Unit: mm

Approx. ø5   Approx. ø6.5

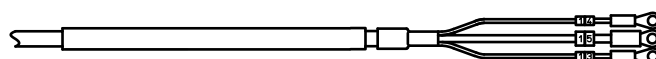Approx. 100   Approx. 90
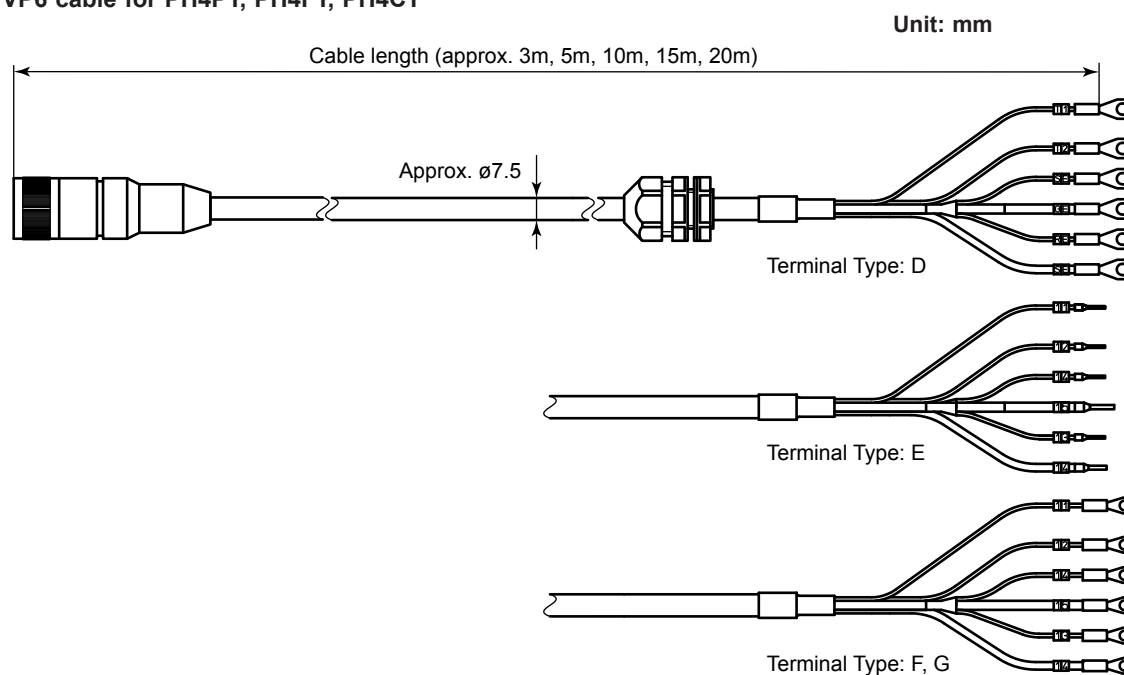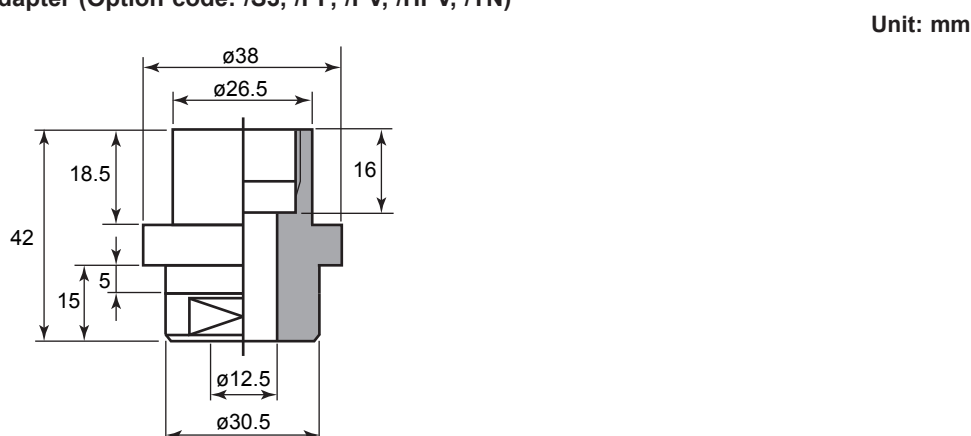
Cable length (approx. 3m, 5m, 10m, 15m, 20m)
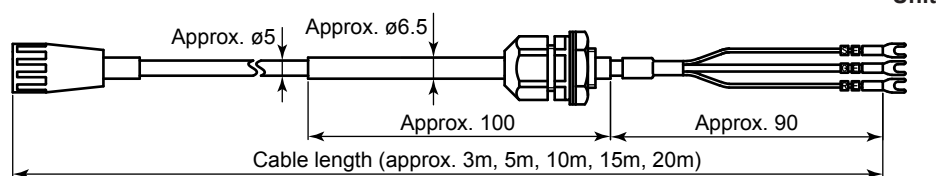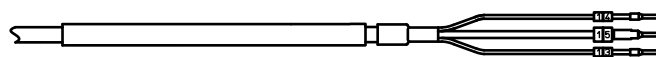
Terminal Type: D

Terminal Type: E

Terminal Type: F, G

Note: There is no terminal type F or G for PH4FE.

VP6 cable for PH4PT, PH4FT, PH4CT

Unit: mm

Cable length (approx. 3m, 5m, 10m, 15m, 20m)

Approx. ø7.5

Terminal Type: D

Terminal Type: E

Terminal Type: F, G

● **Adapter (Option code: /S3, /PP, /PV, /HPV, /TN)**

Unit: mm

ø38
ø26.5
18.5
16
42
5
15
ø12.5
ø30.5

● **Adapter with temperature sensor (SA405)**

Unit: mm

132
105
18.5
(L+270)±50
(L=3, 5, 10m)
ø5

Temperature sensor
(Pt 1000)
ø38
ø30.5
ø26.5
Adapter
Temperature sensor cable

Ring terminal   Pin terminal   Fork terminal