
Instruction Manual

Model WU10 and WE10

VP cable and extension cable



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1. Preface

1.1. Introduction

This instruction manual provides information for the installation and use of the WU10 and WE10 cable. This universal sensor cable is specified for reliable transfer of analog signals and especially designed to be installed in a heavy industrial environment.

This multicore shielded cable is available in several lengths, in a single and a dual coax version. The shielded cable will protect both the sensor and the analyzer for interference from high voltages and currents which are present on other cables.

1.2. Unpacking & Checking

Upon delivery, unpack the product carefully and inspect it to ensure that it is not damaged during shipment. If damage is found, retain the original packing material and immediately notify the carrier and the relevant local Yokogawa Sales office. Make sure the Model Code and Serial Number on the product are the same as on the packing list. Also check if option(s) that were ordered, are included and correct.

1.3. Warranty & Service

Yokogawa products are guaranteed free from defects in workmanship and materials under normal use and service for a period of (typically) 12 months from the date of shipment from the manufacturer. Individual Sales organizations can deviate from the typical warranty period, and the conditions of sale relating to the original purchase order should be consulted.

Damage caused by wear and tear, inadequate maintenance, corrosion, or by the effects of chemical processes is excluded from this warranty coverage. In the event of a warranty claim, the defective goods should be sent (freight paid) to the Service Department of the relevant Yokogawa Sales office for repair or replacement (at Yokogawa's discretion). The following information must be included in the letter accompanying the returned goods:

- Model Code and Serial Number.
- Original Purchase Order and Date.
- Length of time in service and description of the process.
- Description of the fault and circumstances of the failure.
- Process/environmental conditions that may be related to the failure of the sensor.
- Statement as to whether warranty or non-warranty service is requested.
- Complete shipping and billing instructions for return of material, plus the name and phone number of a contact person that can be reached for further information.
- Clean Statement Returned goods that have been in contact with process fluids must be decontaminated and disinfected prior to shipment.

Goods should carry a certificate to this effect, for the health and safety of our employees. Material Safety Data sheets must be included for all components of the process to which the cable has been exposed.

2. General Specifications

2.1 Specifications WU10-V-

	WU10-V-S-...-	WU10-V-D-...-
Description:	Multicore shielded cable with one low noise coax and three insulated wires and drain wire	Multicore shielded cable with two low noise coaxes and four insulated wires
Mechanical specifications Outer diameter Bending radius: <ul style="list-style-type: none"> Fixed installation Frequently bending Insulation materials: <ul style="list-style-type: none"> Outer jacket Coax dielectric Coax sheath Wires Shielding: Finishing:	6,5 mm ± 0,2 mm ≥ 10x outer diameter ≥ 15x outer diameter Polyvinylchlorine (PVC) Polyethylene (HDPE) Polyethylene (TPE-O) Polyolefin Aluminium-coated polyester foil, 30% overlap. 6-P Variopin, wired pin	7,0 mm ± 0,2 mm ≥ 10x outer diameter ≥ 15x outer diameter Thermoplastic Rubber (TPK) Thermoplastic Rubber (TPK) Thermoplastic Rubber (TPK) Thermoplastic Rubber (TPK) Aluminium-coated polyester foil, 30% overlap. 8-P Variopin, wired pin
Electrical specifications: Resistance: <ul style="list-style-type: none"> Coax Wires Drain wire Capacitance: <ul style="list-style-type: none"> Coax (conductor-shield) Coax (conductor-foil) Coax (shield-foil) Insulation resistance: <ul style="list-style-type: none"> Coax (conductor-shield) 	≤ 100Ω/km ≤ 40Ω/km ≤ 80Ω/km ≤ 120pF/m ≤ 100pF/m ≤ 350pF/m > 1 x 10 ¹⁴ Ω	≤ 100Ω/km ≤ 40Ω/km ≤ 80Ω/km ≤ 180pF/m ≤ 100pF/m ≤ 350pF/m > 1 x 10 ¹⁴ Ω
Others: Operating temperature: <ul style="list-style-type: none"> Continuously Limited Colors: <ul style="list-style-type: none"> Outer jacket Coax Wires Drain wire ROHS Flame retardant	-20°C ... +85°C +90°C for 20.000 hrs. +105°C for 1000 hrs. Black Brown Black, Red, Blue Yellow YES No	-30°C ... +100°C +105°C for 20.000 hrs. +125°C for 3000 hrs. Black Brown, White Red, Blue, Yellow, Green Black YES YES (acc. IEC 60332-1)

2.2 Specifications WE10-

	WE10-H-D-...-..
Description:	Multicore shielded cable with two low noise coaxes and four insulated wires, halogen free.
Mechanical specifications Outer diameter Bending radius: <ul style="list-style-type: none"> • Fixed installation • Frequently bending Insulation materials: <ul style="list-style-type: none"> • Outer jacket • Coax dielectric • Coax sheath • Wires Shielding: Finishing:	8,3 mm ± 0,2 mm ≥ 5x outer diameter ≥ 12x outer diameter Polyethylene (TPE-O) Polyethylene (TPE-O) Polyethylene (TPE-O) Polyethylene (TPE-O) Aluminized polyester foil, 100% optical coverage. 8-P Variopin, wired pin
Electrical specifications: <ul style="list-style-type: none"> • Coax/ Wires • Capacitance: • Coax (conductor-shield) Insulation resistance: <ul style="list-style-type: none"> • Coax (conductor-shield) 	≤ 57Ω/km ≤ 57Ω/km ≤ 225 pF/m > 1,5 x 10 ¹⁴ Ω
Others: Operating temperature: <ul style="list-style-type: none"> • Continuously • Limited Colors: <ul style="list-style-type: none"> • Outer jacket • Coax • Wires • Drain wire ROHS Flame retardant oil resistance fire properties smoke properties halogen free	-20°C ... +100°C +105°C for 20.000 hrs. +125°C for 3000 hrs. Black Brown, White Red, Blue, Yellow, Green Black YES YES (acc. IEC 60332-1) 72 h / (100 ± 2)°C / IRM 902 IEC 60332-1-2 / IEC 60332-3-24 IEC 61034-2 >60% (light transmission) EN 50267-2-2 / IEC 60754-2

3. Installation

3.1 Connections of VP single coax cable WU10-V-S

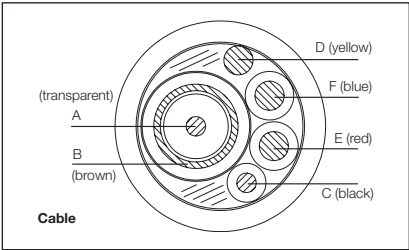


Figure 1 single cable layout

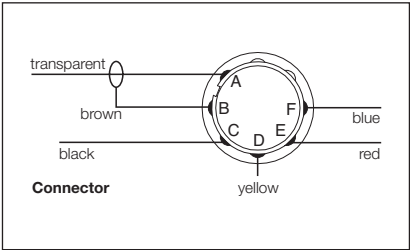


Figure 2 VP-connector single cable

Parameter pH Conventional			
pH conventional is where combined sensor with high ohmic pH membrane and low ohmic internal reference. For ORP and pH-differential measurement the WU10-V-S cannot be used. For these measurements the WU10-V-D or WE10 is necessary			
WU10-V-S	Color	EXA/FLXA terminal no.	Description
Coax core	transparent	15	pH input
Coax shield	brown	13	Ref input
Wire	black	16	pH guard
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Drain wire	yellow	14	Liquid Earth (LE)

Parameter SC
For SC the WU10-V-S cannot be used, for this parameter the WU10-V-D or WE10 is necessary

Parameter ISC
For ISC the WU10-V-S cannot be used, for this parameter the WU10-V-D or WE10 is necessary

Parameter DO-galvanic			
WU10-V-S	Color	EXA/FLXA terminal no.	Description
Coax core	transparent	13	Cathode
Coax shield	brown	15	Anode
Wire	black	16	Membrane check
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Drain wire	yellow	14	Shield

Parameter DO-Polarographic			
WU10-V-S	Color	EXA/FLXA terminal no.	Description
Coax core	transparent	17	Cathode
Coax shield	brown	18	Anode
Wire	black		Not connected
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Drain wire	yellow	14	Shield/Liquid Earth

3.2 Connections of VP dual coax cable WU10-V-D and WE10

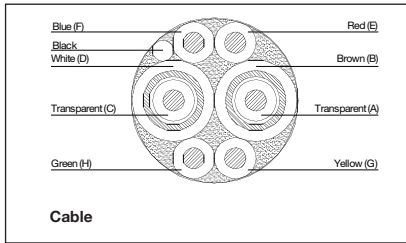


Figure 3 Dual coax cable layout

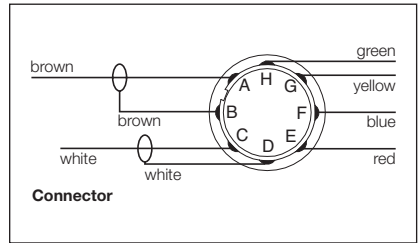


Figure 4 VP- connector dual coax

Parameter: pH conventional+ORP			
pH conventional is where combined sensor with high ohmic pH membrane and low ohmic internal reference.			
WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	15	pH input
Coax1 shield	brown	13	Ref input
Coax2 core	transparent	16	pH guard
Coax2 shield	white	14	Liquid Earth (LE)
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow		Not connected
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter: ORP (for pH conventional)			
WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent		Not connected
Coax1 shield	brown	13	Ref input
Coax2 core	transparent		Not connected
Coax2 shield	white	15 & 14 (interconnected)	Metal / Liquid Earth (LE)
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow		Not connected
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter: ORP (pH compensated, for pH conventional)			
WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	13	Ref input
Coax1 shield	brown		Not connected
Coax2 core	transparent	17	Ref guard
Coax2 shield	white	15 & 14 (interconnected)	Metal/Liquid Earth(LE)
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow		Not connected
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter pH differential+ORP

pH differential is where the combined sensor has two dissimilar glass membranes

WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	15	pH input
Coax1 shield	brown	16	pH guard
Coax2 core	transparent	13	Ref input
Coax2 shield	white	17	Ref guard
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow	14	Liquid Earth (LE)
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter ORP (for pH differential)

WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent		Not connected
Coax1 shield	brown		Not connected
Coax2 core	transparent	13	Ref input
Coax2 shield	white	17	Ref guard
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow	15 & 14 (interconnected)	Metal / Liquid Earth (LE)
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter ORP (pH compensated for pH differential)

WU10-V-D, WE10	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	13	Ref input
Coax1 shield	brown	17	Ref guard
Coax2 core	transparent		Not connected
Coax2 shield	white		Not connected
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow	15 & 14 (interconnected)	Metal / Liquid Earth (LE)
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter SC			
WU10-V-D	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	15	Ui (inner electrode)
Coax1 shield	brown	16	li (inner electrode)
Coax2 core	transparent	13	Uo (outer electrode)
Coax2 shield	white	14	lo (outer electrode)
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow		Not connected
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter ISC			
WU10-V-D	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	13	Receive coil high
Coax1 shield	brown	17	Receive coil low
Coax2 core	transparent	15	Drive coil high
Coax2 shield	white	16	Drive coil low
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow	14	Sensor shield
Wire	green		Not connected
Drain wire	black	63 (4W analyzer only)	Shield

Parameter DO-galvanic			
WU10-V-D	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	13	Cathode
Coax1 shield	brown	15	Anode
Coax2 core	transparent		Not connected
Coax2 shield	white		Not connected
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow	16	Membrane check
Wire	green		Not connected
Drain wire	black	14	Shield

Parameter DO-polarographic			
WU10-V-D	Color	EXA/FLXA terminal no.	Description
Coax1 core	transparent	17	Cathode
Coax1 shield	brown	18	Anode
Coax2 core	transparent		Not connected
Coax2 shield	white		Not connected
Wire	red	11	Pt1000-T1
Wire	blue	12	Pt1000-T2
Wire	yellow		Not connected
Wire	green		Not connected
Drain wire	black	14	Shield

4. Model and Suffix codes

Model	Suffix Code	Description
WU10		Sensor cable
Connector type	-V	Variopin
Cable type	-S -D	Single Coax Dual Coax
Cable length	-02 -05 -10 -15 -20	2 meters 5 meters 10 meters 15 meters 20 meters

Model	Suffix Code	Description
WE10		Generic cable
Material	-H	Halogen free/low smoke/ flame retardant
Cable length	-002 -003 -005 -010 -020 -050 -100 -200	2 m (-VF finishing) 2.95 m (-V1, V2 finishing) 5 m (-FF, -VF finishing) 10 m (-FF, -VF finishing) 20 m (-FF, -VF finishing) 50 m (-FF, -NN finishing) 100 m (-NN finishing) 200 m (-NN finishing)
Finishing	-FF -V1 -V2 -VF -NN	Both ends wire pins finish Variopin male- female (pH conv.) Variopin male- female (universal) Variopin Female wire pins No finish
Options		-

Note:

V1 – for Smart Adapter, model SA11-P1

V2 – for Smart Adapter, model SA11-P2, SA11-C1, SA11-C5, SA11-D1

Appendix 1. IM Protection of environment

Instruction Manual

SC24V, SC25V, SC25F, SM60, SR20,
FC20, BA10, BA11, IB100, SA11,
WE10, WF10, WU10, WU11, WU40
SC41, SC42, SC4A, SX41, SX42
ISC40

Protection of Environment (Use in China)

This manual is valid only in China.
中華人民共和国国内でのみ有効です。



这个标志是基于SJ/T11364, 在中国（不包括台湾, 香港, 澳门）贩售的电子电器产品所适用的环境保护期限, 6种有害物质的含有量都低于GB/T26572所规定的限量要求以下。

Production date

关于生产日期

生产日期在产品铭牌上9位数的序列号中, 用以下形式表示生产日期。

从左数第3位数: 生产年份

R:2015, S:2016, T:2017, U:2018, V:2019, W:2020, X:2021, Y:2022, Z:2023,
1:2024, 2:2025, 3:2026, ...

从左数第4位数: 生产月份

1: 1月, 2: 2月, 3: 3月, ..., 9: 9月, A: 10月, B: 11月, C: 12月
(示例) N3S700001: 2016 年 7 月

Subject to change without notice



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