



BELVEN SMART VALVE  
THEMIS SERIES

**Belven Controls, Beyond Valves**



# BELVEN SMART VALVE THEMIS SERIES

BVSV is applied in the hydraulic network of the heating and cooling system to realize holographic data collection and hydraulic control of the network; it solves the problem of systematization of data collection of the network system and synchronization of hydraulic balance control. All data can be displayed locally through mobile terminals or presented on cloud platforms through RS-485 and MODBUS-RTU transmission, which can provide hardware support for digital management and control of the network.

BVSV can realize valve position, flow, pressure difference, temperature, temperature difference, and energy control based on the collected system data; at the same time, control parameters can be manually set through APP and platform. Platform algorithm output and remote parameter setting are supported, ultimately realizing digital hydraulic balance control of the system.

**TECHNICAL SPECIFICATION**

- Size: DN25-DN450
- Leakage rate: No leakage at the factory (correct flow direction)
- Medium: Water or neutral fluid
- Working temperature: Medium temperature 0°C ~100°C , ambient temperature -20°C ~70°C
- Connection: Threaded/flange connection
- Pressure range: 0~16bar
- Pressure rating: PN16
- Temperature measurement accuracy: Class AA
- Flow measurement accuracy:  $\pm 2\%$  (  $\geq 4\%Q_{nom}$  )
- Pressure measurement accuracy:  $\pm 0.5\%FS$  (FS means the max pressure range)
- Control accuracy: Minimum controllable flow 4%Qnom  
 $\pm 10\%$  4%~10%Qnom  
 $\pm 5\%$   $\geq 10\%Q_{nom}$
- Overload pressure: 200%FS
- Acquisition frequency: 2S (custom)
- Valve core construction: Ball valve/Butterfly valve
- Control characteristics: Equal percentage characteristics and linear optional
- Data output: Energy/load/flow/temperature/temperature difference/pressure/pressure difference/valve position feedback/setting parameters/pipeline network attributes
- Control output: static balance/dynamic flow balance/dynamic pressure difference balance/temperature difference/temperature (three types)/energy control

Note: Pressure above PN16 or medium temperature above 80°C is available upon request.

**MATERIAL**

Body	DN25~DN50: Brass DN50~DN450: Carbon steel/ductile iron/stainless steel
Core/shaft	DN20~DN50: Stainless steel/Brass DN50~DN450: Stainless steel
Meter head	PC+ABS plastic
Meter head cover	ABS plastic
Sealing Materials	Temperature Base: EPDM/FKM Pressure base: PTFE Transducer base: NBR/FKM Shaft base: NBR/FKM Core base: PTFE
Pressure guide and exhaust connector	Brass
Three-way switching valve	Brass
Pressure probe	Stainless steel
Temperature probe	Stainless steel
Temperature and pressure base	Stainless steel
Ferrule connect	Brass/Stainless steel
Transducer base	Brass/Stainless steel

## TECHNICAL SPECIFICATION

Sensor components	Temperature sensor	PT1000 Class AA Core
	Flow sensor	Ultrasonic Piezo Ceramic Core
	Pressure sensor	Piezoresistive Diffused Silicon Core
Data communication	Communication interface	RS485, Bluetooth
	Communication protocol	MODBUS-RTU, CJ/T188
Input/output signal	RS485	MODBUS RTU
	Bluetooth	MODBUS RTU
	Analog value	0~10V
		2~10V
		0~20mA
		4~20mA
	Switching value	Dry contact
Data display	Display form	Local mobile terminal display
	Display content	Energy, Load, Flow, Temperature, Temperature Difference, Pressure, Differential Pressure, Valve Position Feedback, Set Parameters
Wiring method	Self-contained cable	
Pressure difference range	Maximum differential pressure $\Delta P_{max}$	450KPa ( $\Delta P_{max}$ : maximum differential pressure when all properties are met)
	Closing differential pressure	600KPa
Small diameter electrical parameters (DN25~DN150)	Rated voltage	24VDC $\pm$ 10%
	Rated power	14W
	Static holding	2W
	Moisture-proof power	5W (built-in heater)
Large diameter electrical parameters (DN200~DN450)	Rated Voltage	220VAC
	Rated power	DN200:102W
		DN250:130W
		DN300:190W
		DN350:192W
		DN400:212W
		DN450:212W
	Static Holding	12W
	Moisture-proof power	8W (built-in heater)
Manual operation	Manual operation allowed in power-off/manual mode	
Protection level	IP54	
Output torque	DN25~DN150	70N·m
	DN200~DN450	350~2500N·m
Control speed	15~100s/90° (default 60s/90°)	
Maintenance requirement	Maintenance-free	

## FLOW RANGE

Flow rate range for different sizes (Qmin~Qnom)		
Brass (ball valve)	Carbon steel/ductile iron/stainless steel (ball valve)	Carbon steel/ductile iron/stainless steel (butterfly valve)
DN25: 0.14 ~ 3.5m <sup>3</sup> /h DN32: 0.19 ~ 4.8m <sup>3</sup> /h DN40: 0.32 ~ 8.0m <sup>3</sup> /h DN50: 0.48 ~ 12.0m <sup>3</sup> /h	DN50: 0.6 ~ 15m <sup>3</sup> /h DN65: 1.0 ~ 25m <sup>3</sup> /h DN80: 1.6 ~ 40m <sup>3</sup> /h DN100: 2.4 ~ 60m <sup>3</sup> /h DN125: 4.0 ~ 100m <sup>3</sup> /h DN150: 6.0 ~ 150m <sup>3</sup> /h DN200: 10.0 ~ 250m <sup>3</sup> /h	DN200: 10.0 ~ 250m <sup>3</sup> /h DN250: 16.0 ~ 400m <sup>3</sup> /h DN300: 24.0 ~ 600m <sup>3</sup> /h DN350: 30.0 ~ 750m <sup>3</sup> /h DN400: 36.0 ~ 900m <sup>3</sup> /h DN450: 48.0 ~ 1200m <sup>3</sup> /h

## FEATURES

<b>Data Output</b>	Energy / Load / Flow / Temperature / Differential Temperature / Pressure / Differential Pressure / Valve Position Feedback / Setting Parameters / Network Properties
<b>Control Outputs</b>	Static Balance / Dynamic Flow Balance / Dynamic Differential Pressure Balance / Differential Temperature / Temperature (three types) / Energy Control
<b>Control Characteristics</b>	Equal Percentage Characteristics and Linear Selectable

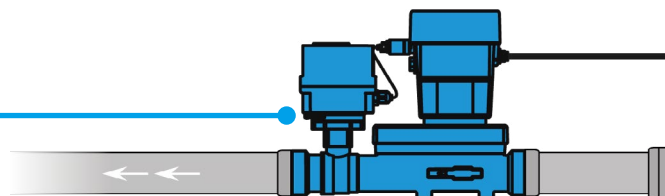
## SELECTION PRINCIPLE

In order to prevent the influence of local resistance disturbance caused by reducer on the accuracy of ultrasonic flow detection, the design pipe diameter should be selected, and the design flow rate should fall within the measuring range.



### FEATURES

Flow rate: 17.8 m<sup>3</sup>/h  
Valve position: 80.0%  
Return water pressure: 356.0KPa  
Return water temperature: 12.7°C



Control target: 95.0 KPa  
Target measurement: 94.6 KPa  
Control mode: Dynamic pressure difference control  
Working mode switching: Refrigeration working mode



#### NEW DISPLAY MODE

Bluetooth scanning/Modbus-RTU/RS485, realizing non-contact display and parameter setting



#### NEW STRUCTURAL DESIGN

Unique exhaust and backwash design, dual-channel valve body structure and thermal insulation design make pressure data measurement output more accurate and durable, and flow data measurement more accurate



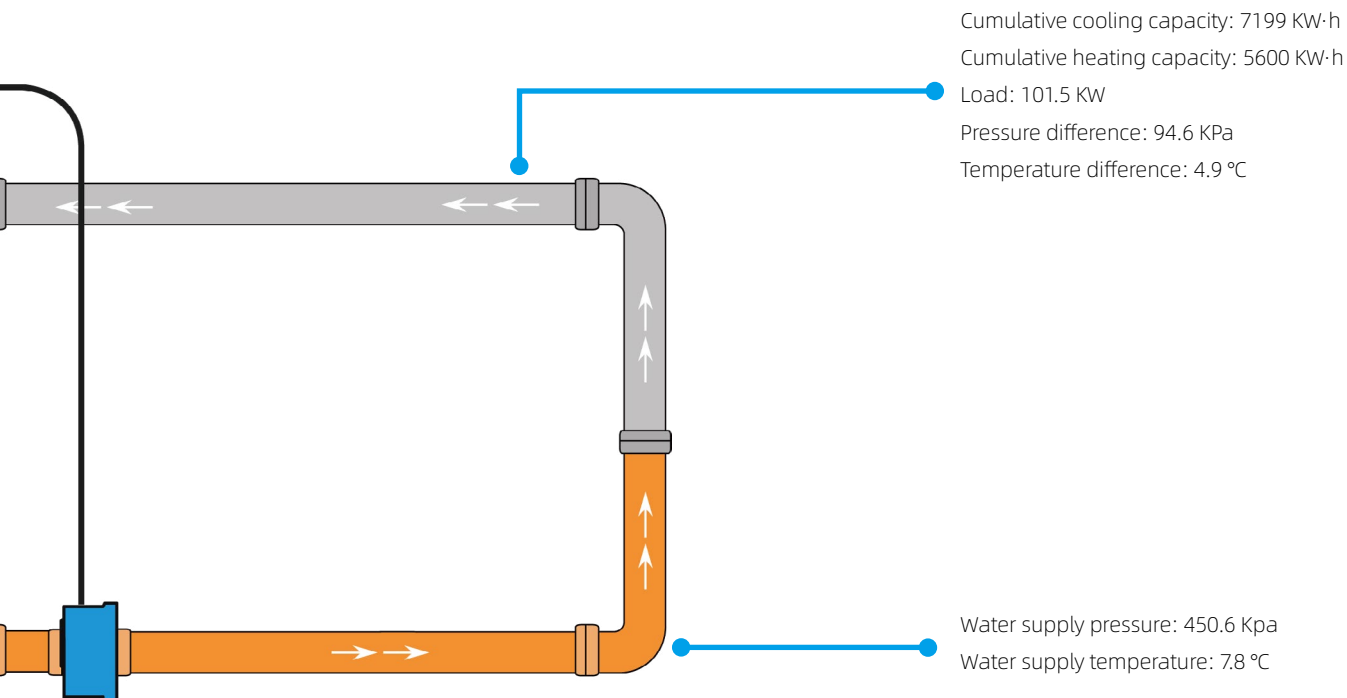
#### NEW DATA PROCESSING

Easy data access to the smart water conservancy platform to achieve systematic and synchronous data collection  
Data management



#### RELIABLE SETTINGS

Precisely control the equipment through professional APP or platform, effectively reducing system debugging and diagnosis time



#### WINTER AND SUMMER SWITCHING

Automatically determine the winter and summer mode to realize automatic switching of winter and summer working conditions



#### MULTIPLE CONTROL METHODS

Multiple balance control logics, including static balance, dynamic flow balance, dynamic pressure difference balance, temperature, temperature difference, and energy control modes to choose from, greatly meeting the system's various hydraulic control needs



#### VISUAL DATA

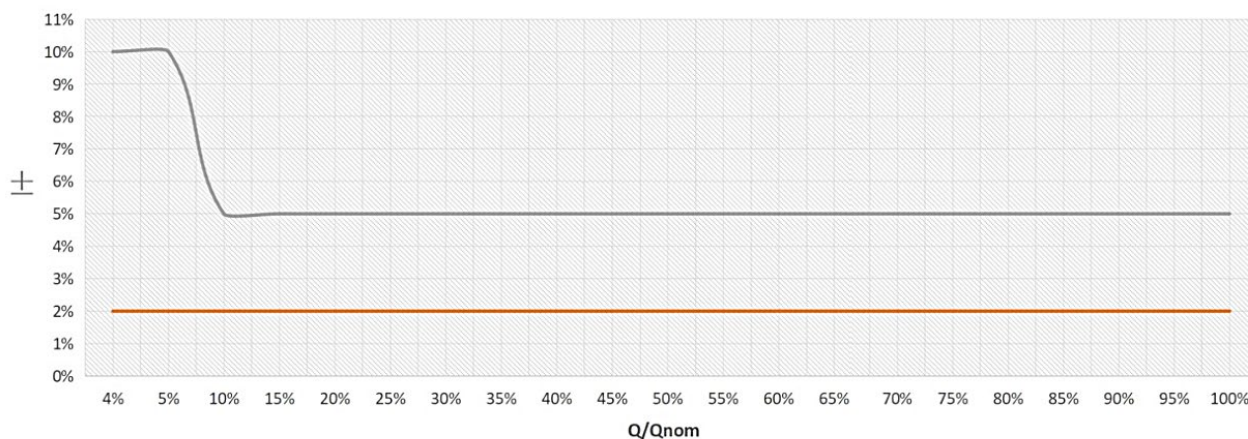
Remote control, one-click acquisition of pipe network data curves, to help the refined management of the system



#### MODULAR DESIGN

Modular product design to achieve pressure replacement of key components, more convenient maintenance

## FLOW ACCURACY CURVE



— Flow control accuracy

— Flow measurement accuracy

## CODING SYSTEM

## BELVEN SMART VALVE THEMIS

**BV** | **SV** - **THEMIS** - **32** - **G**

BV brand | Belven Smart Valve | Star Version | Size | Material: ductile iron

Flow, pressure and temperature integrated  
(Flow rate, temperature, pressure difference)

H: Brass (DN50 and below optional)  
W: Carbon steel (DN50 and above optional)  
S: Stainless steel (DN50 and above optional)  
G: Ductile iron (DN50 and above optional)

## BELVEN SMART VALVE

**BV** | **SV** - **Q/QT** - **32** - **G**

BV brand | Belven Smart Valve | Standard Version | Size | Material: ductile iron

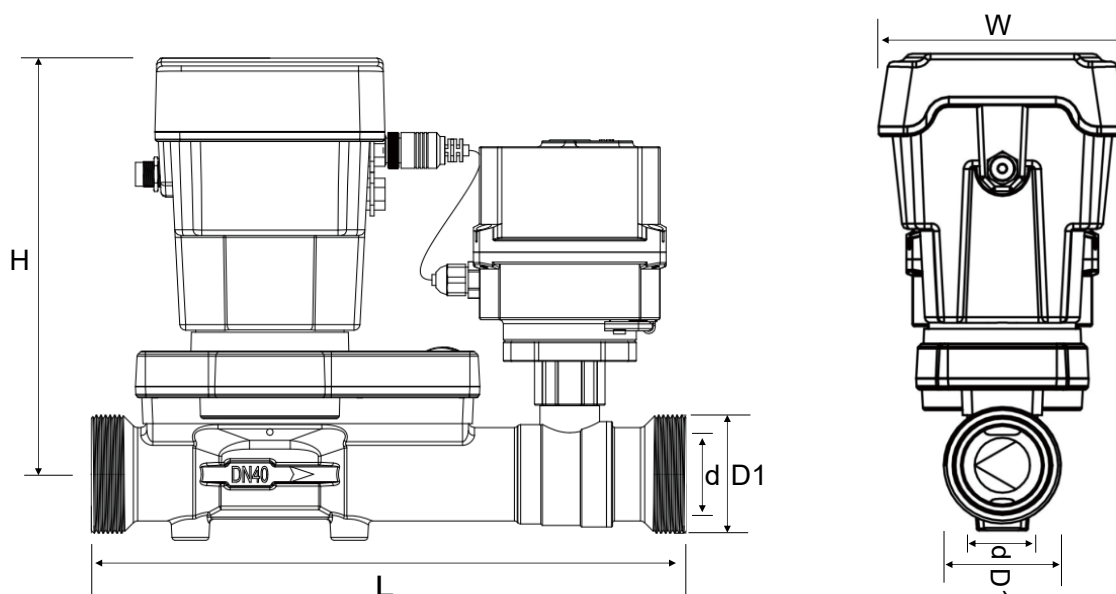
Q: Flow Only  
QT: Flow, temperature

H: Brass (DN50 and below optional)  
W: Carbon steel (DN50 and above optional)  
S: Stainless steel (DN50 and above optional)  
G: Ductile iron (DN50 and above optional)

## TEMPERATURE AND PRESSURE SENSOR

**BV** - **25** - **16**

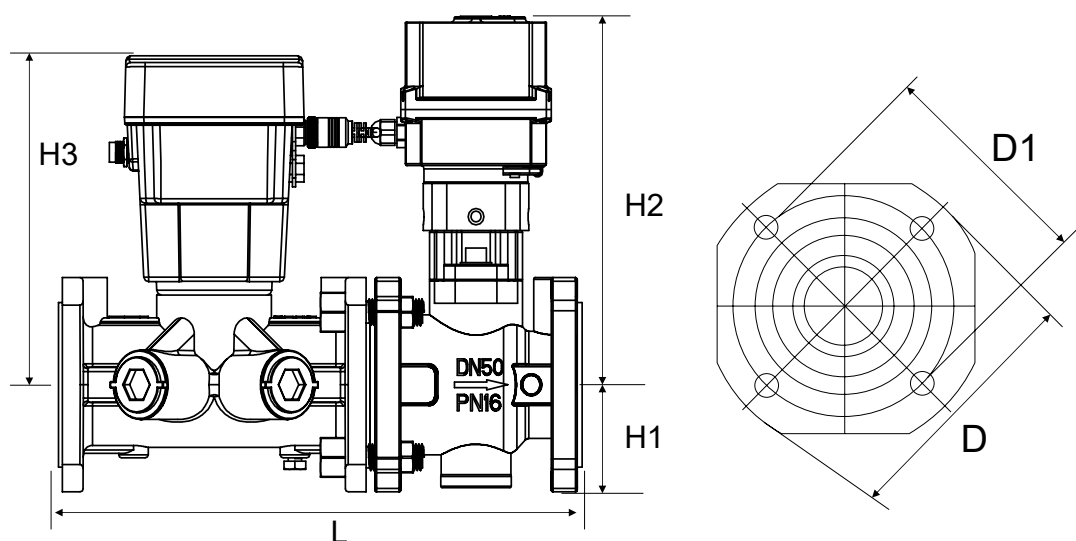
BV brand | Probe length | Pressure range

**DIMENSIONS**


SIZE	L (mm)	H (mm)	W (mm)	D1 (mm)	d (mm)	KVS	WEIGHT (kg)
DN25	300	204	125	G1 1/4	25	10.5	2.8
DN32	300	213	125	G1 1/2	32	12.5	4.3
DN40	300	213	125	G2	40	22.9	4.9
DN50	300	214	125	G2 1/2	50	33.9	5.6

Note: 1. Main material: brass; 2. Threaded connection (ISO 228-1:2000); 3.Core construction: V-shaped hemisphere; 4. Weight only for star version

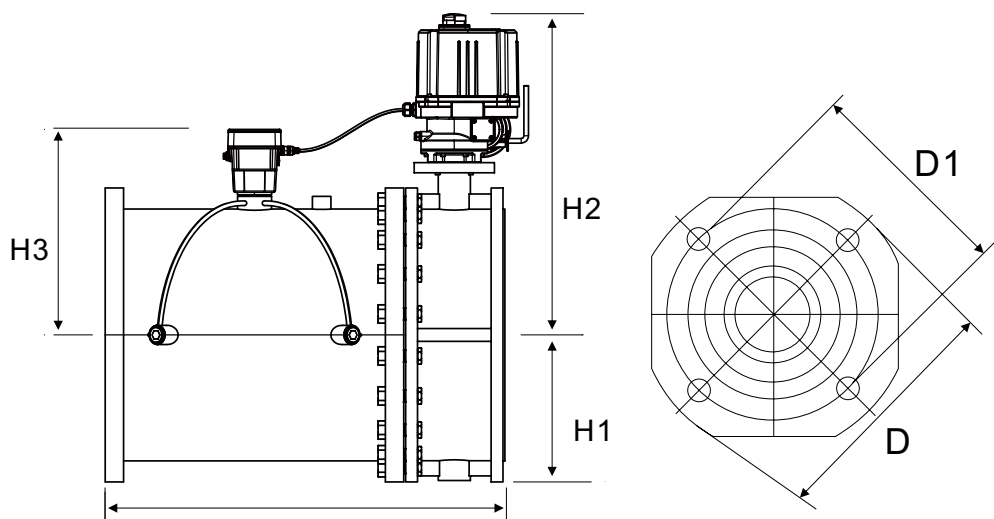
## DIMENSIONS



SIZE	BOLT NUMBER OF HOLES-HOLE DIAMETER	D (mm)	D1 (mm)	L (mm)	H1 (mm)	H2 (mm)	H3 (mm)	KVS	WEIGHT OF DUCTILE IRON (kg)	WEIGHT OF STAINLESS STEEL (kg)	WEIGHT OF CARBON STEEL (kg)
DN50	4-19	165	125	340	65	235	190	45	16.3	17.6	17.5
DN65	4-19	185	145	341	75	240	205	52	18.9	20.4	20.3
DN80	8-19	200	160	402	92	252	208	78.8	26.5	28.6	28.4
DN100	8-19	220	180	440	101	268	224	137	32.1	34.6	34.4
DN125	8-19	250	210	471	115	282	250	195	42.1	45.5	45.2
DN150	8-23	285	240	553	135	294	265	276	57.9	62.4	62.1
DN200	12-23	340	295	653	159	314	311	465	87.7	94.7	94.1

Note: 1. Main material: ductile iron/stainless steel/carbon steel optional; 2. Flange connection (ISO 7005-2:1988); 3. Core construction: W-shaped hemisphere; 4. Weight only for star version

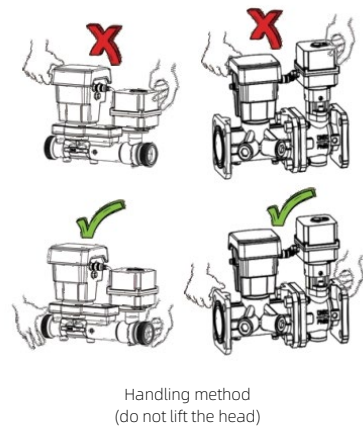
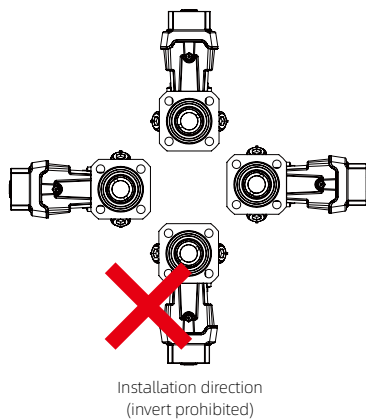
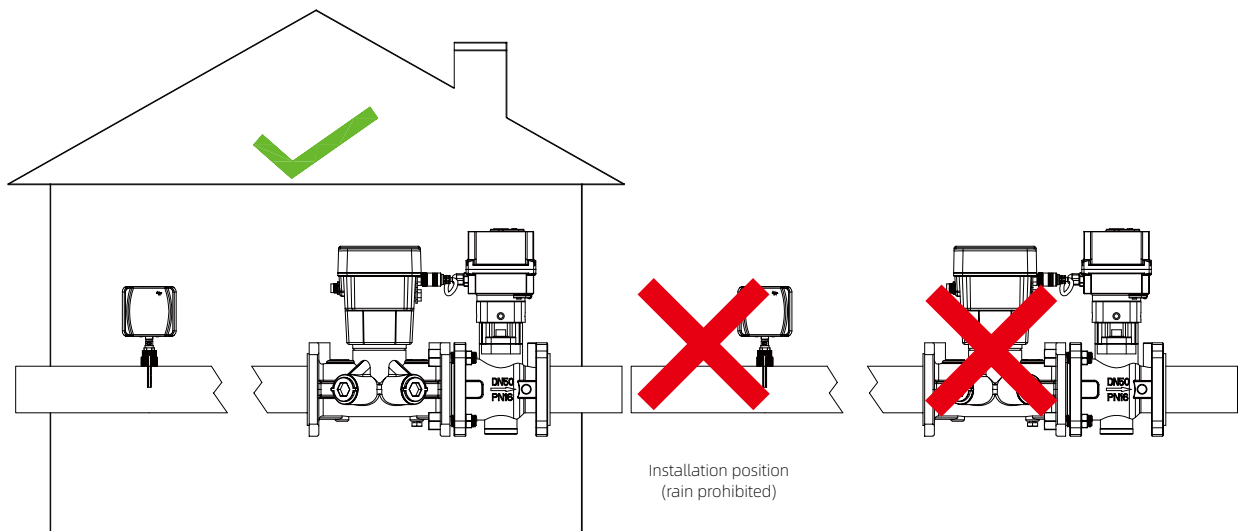
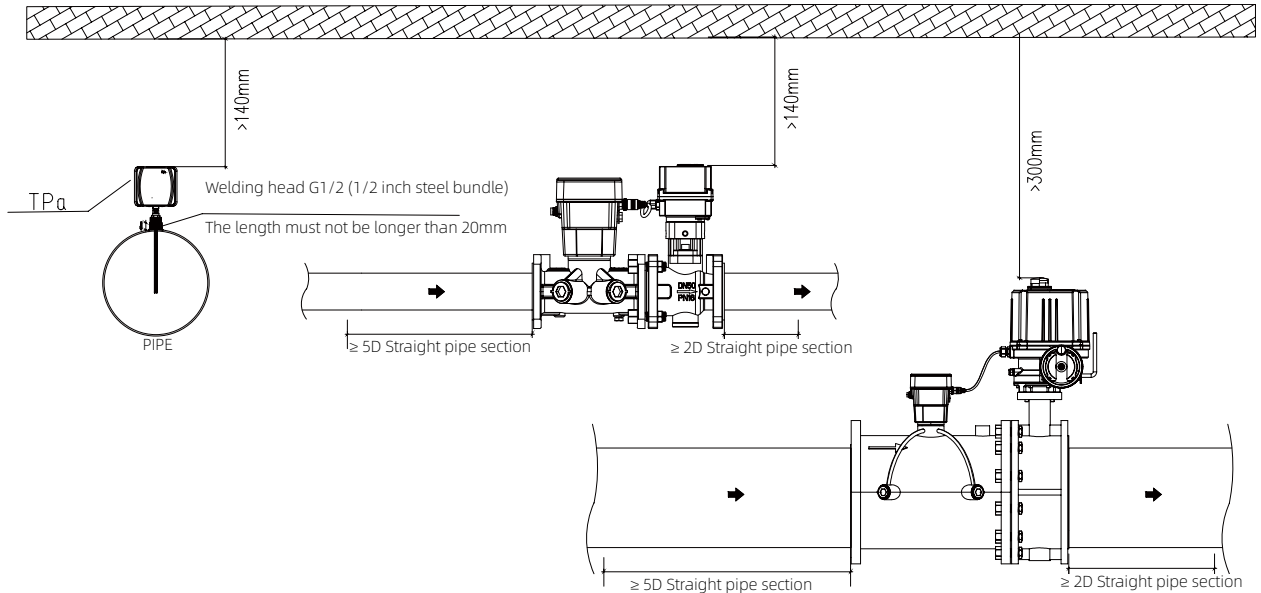
## DIMENSIONS



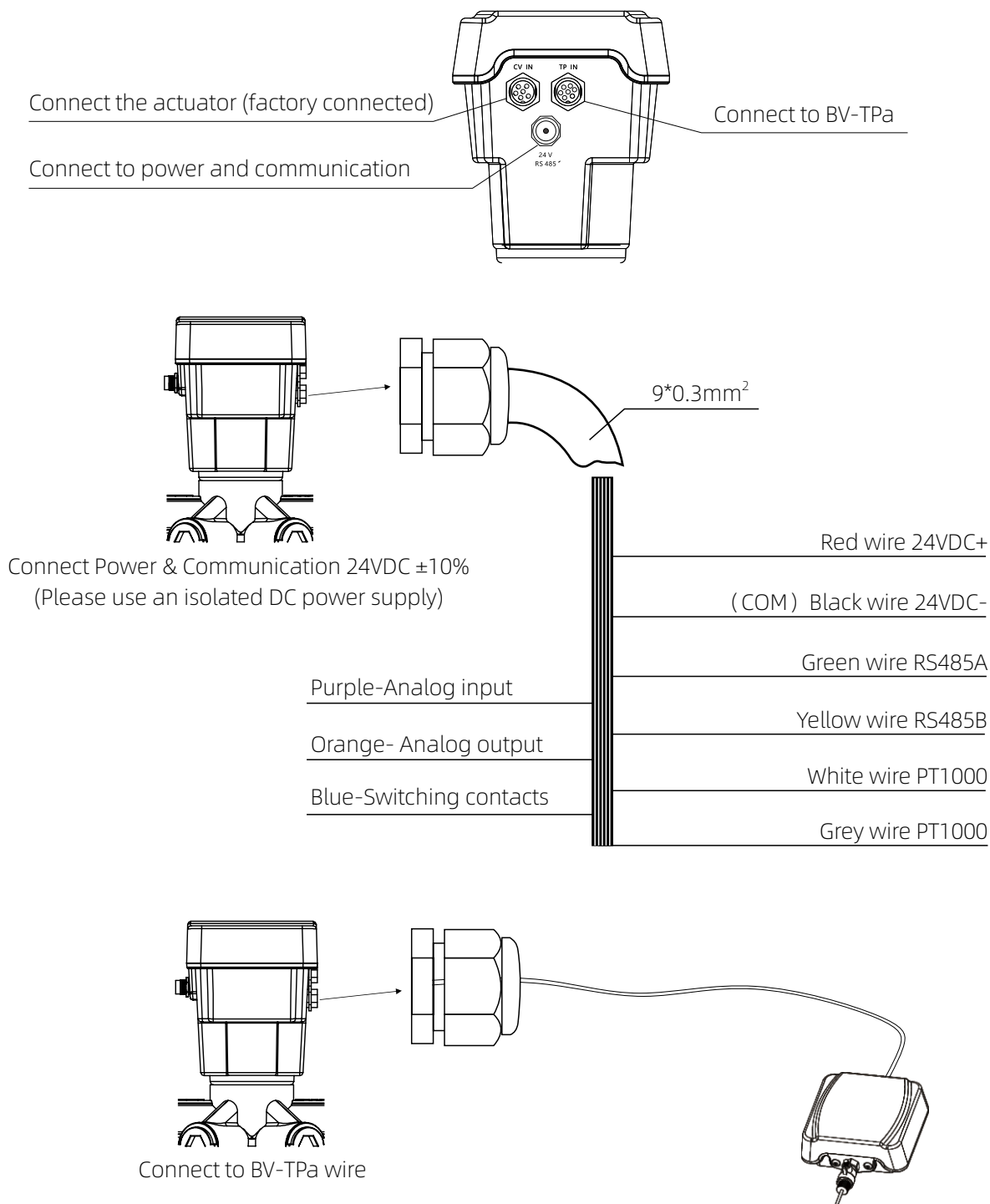
SIZE	BOLT NUMBER OF HOLES-HOLE DIAMETER	D (mm)	D1 (mm)	L (mm)	H1 (mm)	H2 (mm)	H3 (mm)	KVS	WEIGHT OF DUCTILE IRON (kg)	WEIGHT OF STAINLESS STEEL (kg)	WEIGHT OF CARBON STEEL (kg)
DN200	12-23	340	295	515	170	576	306	2709	92.5	94.5	94.1
DN250	12-28	405	355	615	203	606	334	5583	115.8	126.8	124.3
DN300	12-28	460	410	678	230	634	359	7602	143.2	152.1	153.7
DN350	16-28	520	470	740	260	670	389	10273	193.4	235.3	207.7
DN400	16-31	580	525	816	290	702	414	14128	300.2	355.9	322.3
DN450	20-31	640	585	870	320	702	448	18712	351.9	413.9	377.8

Note: 1. Main material: ductile iron/stainless steel/carbon steel optional; 2. Flange connection (ISO 7005-2:1988); 3. Core construction: Floating butterfly plate; 4. Weight only for star version

**INSTALLATION DIAGRAM**

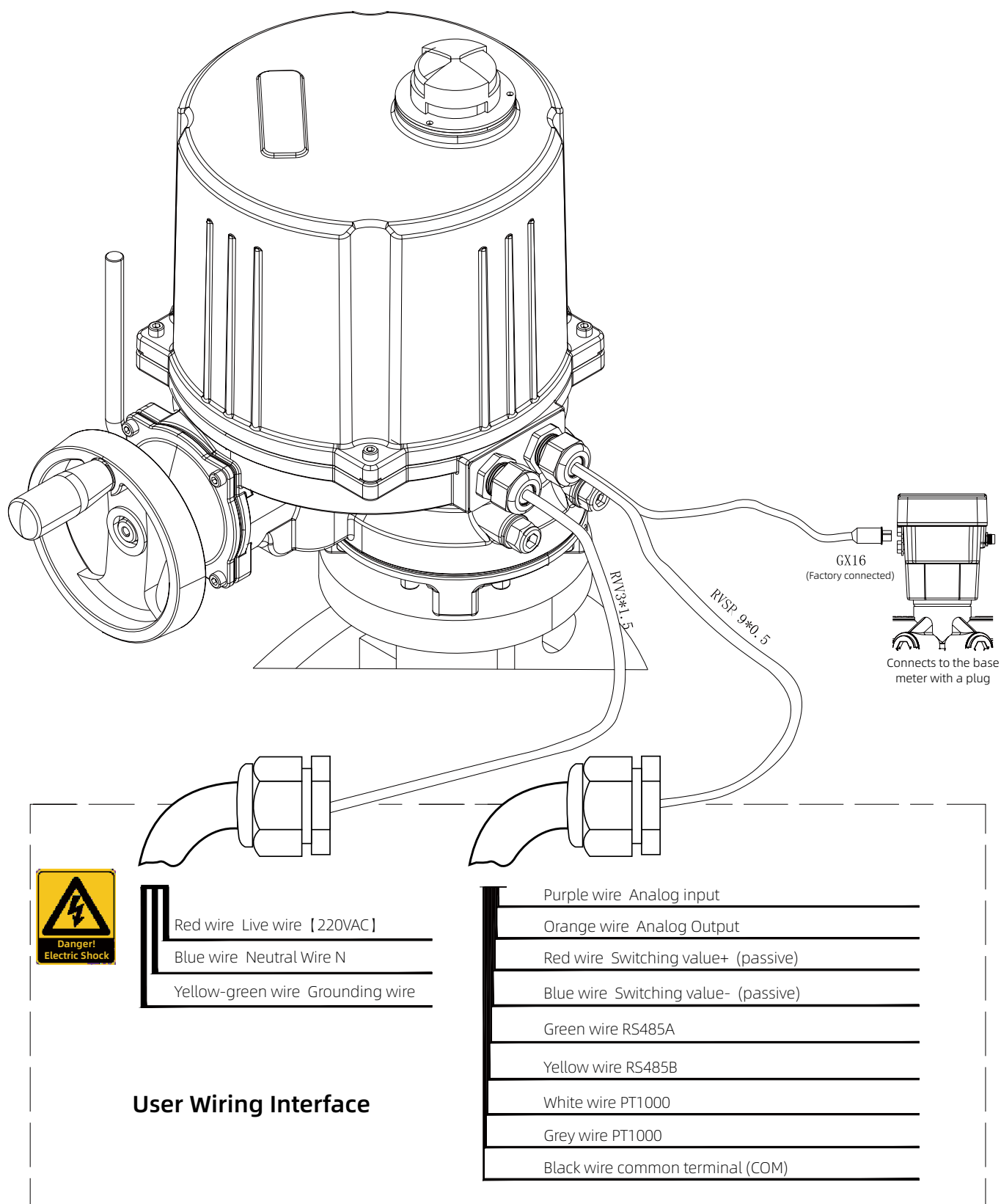


**SMALL DIAMETER WIRING DIAGRAM**



Note: The factory standard cable is 1.5m long. Other specifications are available upon request.

**LARGE DIAMETER WIRING DIAGRAM**





IN VALVES  
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De la soupape 阀门 バルブ Ventil  
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