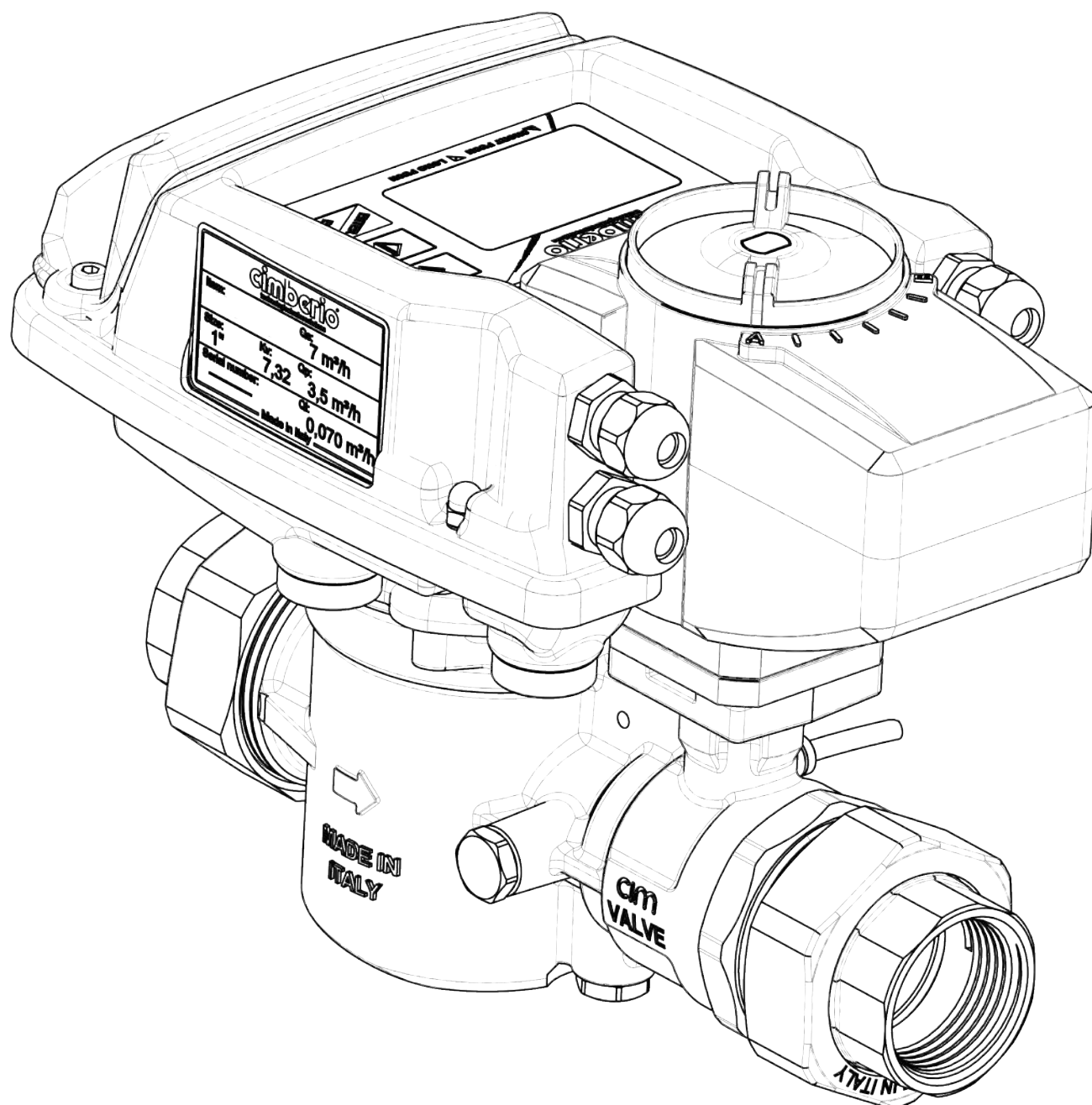


KNOLVAL Smart Energy Valve - cim® 9750



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DESCRIPTION

Knolval is an eco-system of electronic valves integrated by a control and monitoring system for managing business and industrial HVAC plants (heating, ventilation and air-conditioning); this system is applied to new plants or for retrofitting existing installations.

Knolval Cim-9750 turns the valves from simple actuators of the water flow distribution into smart and active points that accurately control the amount of heat transfer fluid flowing through the terminals of the system.

The system has the following main features:

- Valve size range from 1/2" up to 2";
- Embedded electronic control of the system's thermodynamic parameters: the system can automatically adjust any load variations that may occur in the system, in order to reach the required temperature setting/flow rate power;
- Flow rate measurement and control;
- Water temperature measurement at the inlet side of the terminal;
- Water temperature measurement and control at the outlet side of the terminal;
- Measurement and control of the regulating valve degree of opening;
- Measurement and control of power/energy exchanged by the terminal;
- Communication protocols ModBus TCP (over ethernet) Modbus RTU (over RS485) ethernet port only.
- Energy meter for both heating and cooling application;
- Water meter;
- Designed for integration with building management systems (BMS);
- RGB LED with status indication of Heating, Cooling, Measurement, Errors.

REGULATING VALVE

Main features of regulating valves:

- Two way ball valve made of DZR lead free brass alloy;
- Ball with flow passage characterized by an accurate flow regulation
- Two pieces connection ends which allow an easy valve installation
- Electric motor actuator with stroke indicator and emergency manual operation

FLOW SENSOR

Main features of flow sensor:

- Electromagnetic flow sensor for conductive media
- High measurement accuracy;
- The sensor allows flow measurements and energy calculations even with mixtures of water and glycols
- The flow measurement is not affected by small air bubbles in the system.
- Bi-directional electromagnetic flow sensor

KEY FEATURES

KEY FEATURES	
Accuracy	Being in Class 2 according to MI004, the Knolval Cim-9750 represents the highest level of energy metering accuracy
Measurement Repeatability	The electromagnetic flow-sensor ensures a very reliable measuring and control device with the highest repeatability
Glycol Immunity	The valve and the electromagnetic flow-sensor are immune to the presence of glycol and/or other additives that alter the density and viscosity of the thermal fluid
Compact Body	The valve and flow sensor are integrated in a single, compact, and powerful device
Accurate Control	The valve integrates sensors to measure temperature, flow rate, and thermal power. These data enable more accurate control and dynamic adjustment of the HVAC system
Energy Efficiency	Thanks to accurate measurement, the Knolval Cim-9750 can adapt its operation in real time to optimize energy consumption of the system, reducing waste and improving overall efficiency
Intelligent Communication	The Knolval Cim-9750 can communicate with automation systems via standard protocols such as BACnet and Modbus, both over RS485 and Ethernet IP
Remote Monitoring	The remote monitoring capability allows system operators to control and optimize valve performance, simplifying maintenance and continuous system management
Operational Cost Savings	The Knolval Cim-9750 enables the plant to operate within optimal flow and temperature ranges to ensure the best equipment performance
MI004	The MID (Measuring Instrument Directive) covers the entire instrument without distinction between the valve and the meter

TECHNICAL DATA

VALVE	
Type	2-way characterized modulating ball-valve
Size	1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
Material	EN12165 CW511L-DW Ni-Sn protective coating
Body valve material	EN12165 CW511L-DW Ni-Sn protective coating
Screwed end material	EN12165 CW511L-DW Ni-Sn protective coating
Ball material	EN12165 CW511L-DW (from 1/2" up to 1 1/4") CrIII protective coating EN1982 CC770S-DW low lead (from 1 1/2 up to 2") CrIII protective coating
O-ring	EPDM Perox
Actuator connection	UNI 5211 F4 Q9 ISO-Click patented

ACTUATOR	
Type	Rotative - stepper
Voltage	24 V AC/DC (50/60Hz)
Power	5 VA – 4,5W
Protection IP	IP54
Input	2-10 V DC
Output	2-10 V DC
Torque	10 Nm
Nominal stroke	90°
Certification	EN60730-1

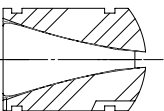
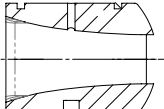
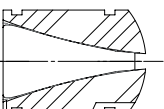
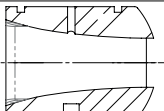
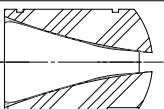
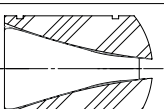
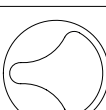
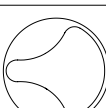
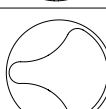
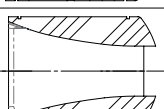
ELECTROMAGNETIC FLOWRATE SENSOR	
Qp[m³/h]	1,5 - 2,5 - 3,5 - 6 - 10 - 15 (mc/h)
Minimum conductivity	>= 20 µS
Liquid temperature range	-10° ... +110°C
Nominal pressure [bar]	PN 25
Flow sensor and body material	Laiton/Composite PEEK / Electrodesen HC276 (Hastelloy)
Gaskets	PTFE and FPM

TEMPERATURE SENSOR	
Type	PT500 – DS/PS type - 2 wires - d 5,2mm – Class B (EN60751) – MI004
Temperature sensor cable length and material	3 m / 5 m - Silicon
Temperature sensor material	1.4404 / 316L

ELECTRONIC UNIT	
Display	Back lighted LCD display with n.3
Power supply	24V AC/DC (operating only with safety isolating transformer according EN 61558-2-6)
User interface	USB-C port for PC connection and MCP software (license free)
Data storage	F-ram non volatile storage
Cable gland	N.4 with plastic Cable Glands PG7
Communication port	Serial RS485 / Ethernet
Communication protocols	MODbus RTU/IP / BACnet MS-TP / FTPs, WEBs, NTPs, ...
Digital Output	N°1 ON/OFF, 1250 Hz, 100mA, 30 Vdc
Digital Input	N°1 programmable
Analogue Input	N°1 programmable 0-10 V or 0-22 mA
Special feature	• Regulation set points: Flowrate, Power, delta Temperature, T1, T2 • Glycol full chemical compatibility • Water + Glycol, both Ethylene or Polypropylene up to 40% concentration calculation MI004 approved • Web-Server integrated for sharing data with BMS and IoT platforms, plus user-friendly web pages for quick analysis of the device's status.

OVERALL FEATURES	
Metrological	M.I.D. – 2014/32/EU – Annex VI (MI-004) – Class 2
International standard	EN1434 (2022)
International marking	CE
IP Protection rate	IP54
Humidity range	Max 95% RH, non-condensing
Accuracy	± 0,8 Read values
Installation position	Vertical, horizontal no upside down
Voltage	24VAC/DC

RANGEABILITY OF FLOW MEASUREMENT

DN	qmin (l/h)	qi (l/h)	qp (l/h)	qs (l/h)	Kv	insert design	
		* According to EN1434-1 (MID directive)					
15	6	-	1000	-	1.6		
	10	30	1500	3000	* 3.6		
20	6	-	1100	-	1.7		
	10	34	1700	3500	* 3.6		
25	20	70	3500	7000	* 7.3		
32	20	-	4500	-	7.3		
	30	120	6000	10.000	* 12.7		
40	60	200	10.000	20.000	* 35.0		
50	60	300	15.000	24.000	* 35.0		

***: EN1434-1 (MID directive certified model)**

q_i: lower limit of flow rate

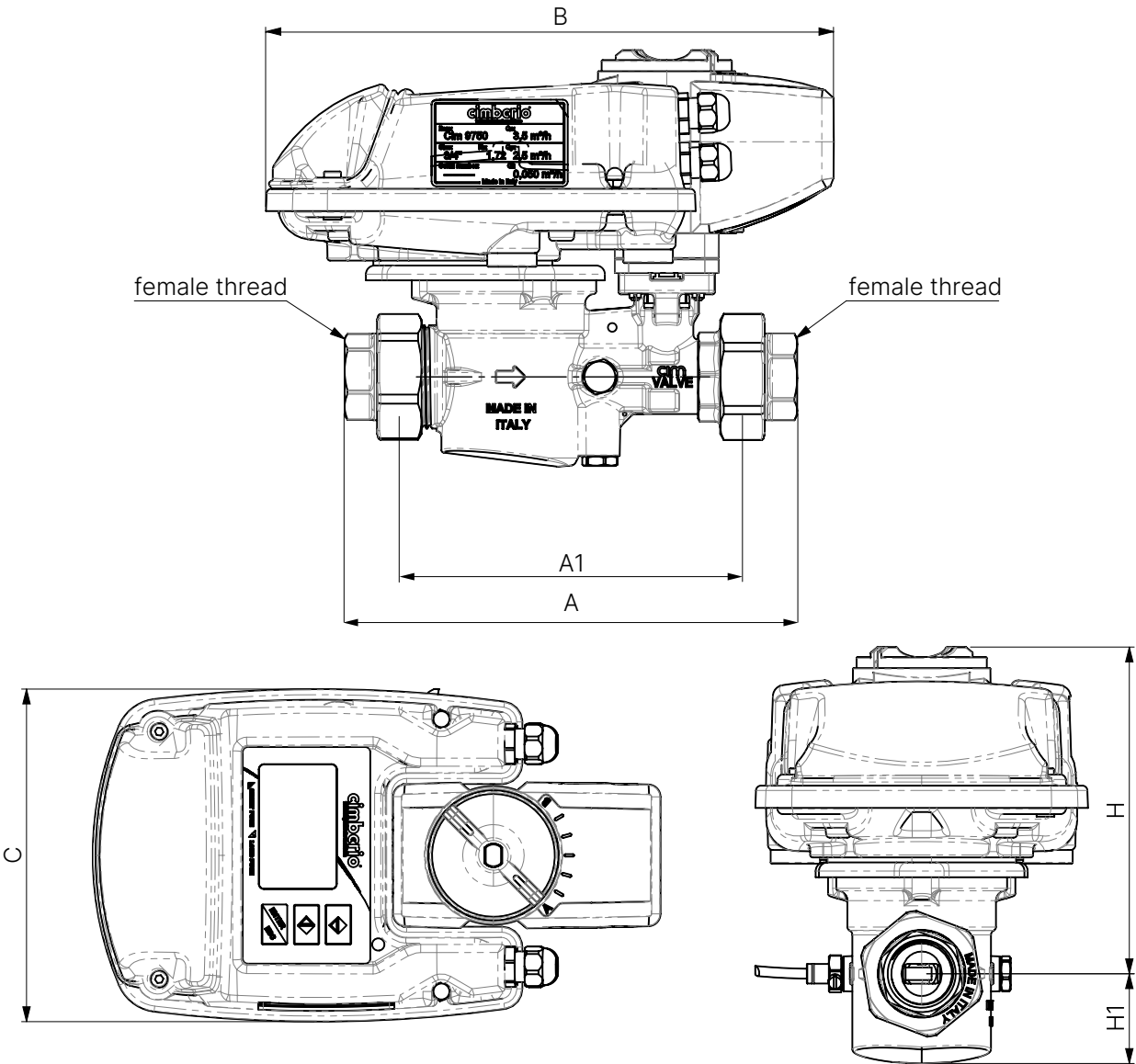
q_p: permanent flow rate

q_s: upper limit of flow rate

According to EN1434-1

q_{min}: minimum flow rate detectable by instrument and controlled by valve.

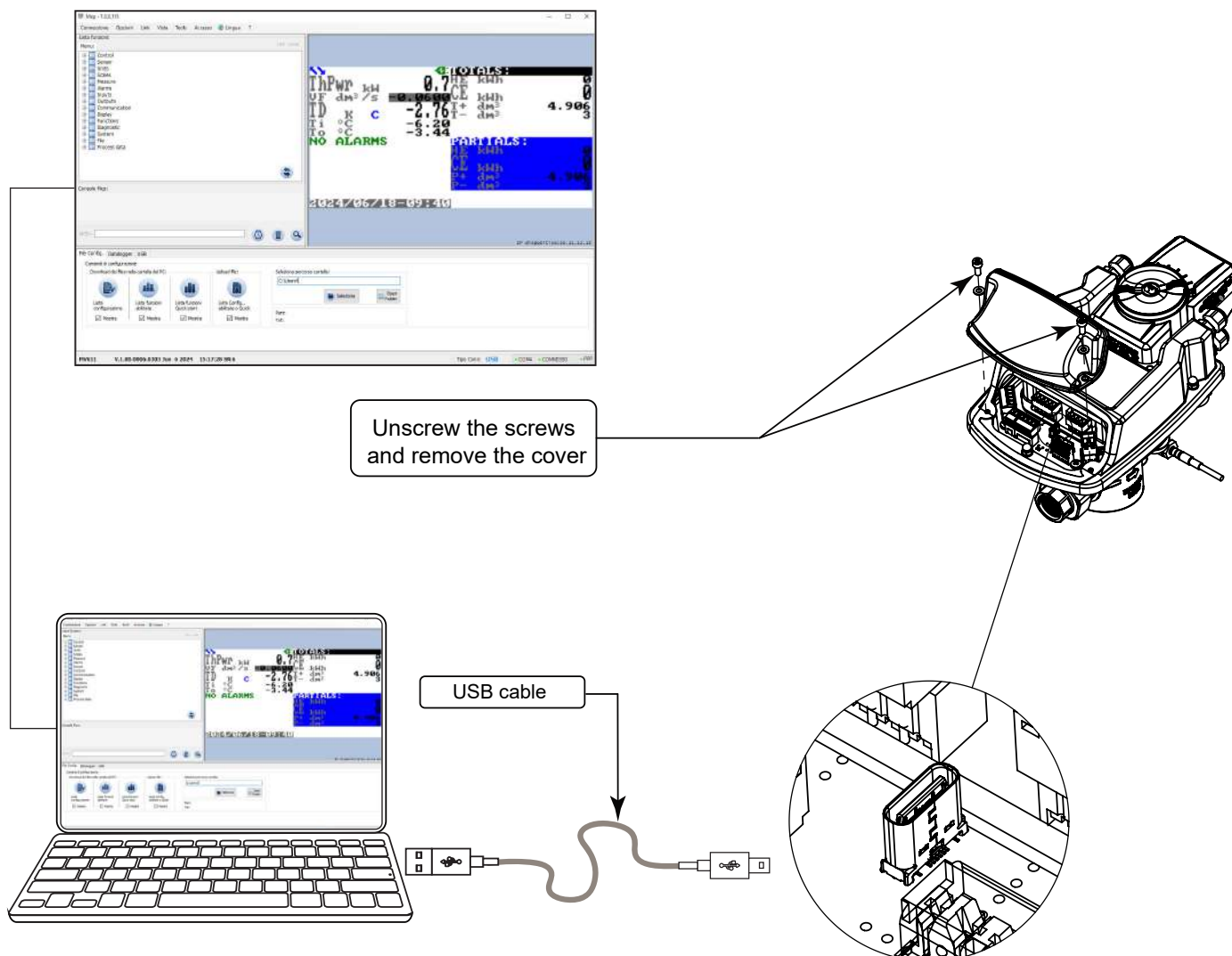
OVERALL DIMENSIONS



Dimensions						
DN	15	20	25	32	40	50
Thread (inches)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A (mm)	177	182	212	216	271	275
A1 (mm)	140	141	163	166	208	212
B (mm)	225	225	225	225	225	225
C (mm)	134	134	134	134	134	134
H (mm)	132	132	139	139	151	151
H1 (mm)	36	36	39	39	48	48
Weight (g)	2475	2672	3274	3590	5215	5905

USER INTERFACE

MCP is a Windows® software that allows to set all the converter functions and personalize the menu. To use MCP interface consult the relevant user manual.



The physical connection between the PC and the computer is made using the USB cable not supplied with the converter.

CIMBOX – REMOTE ASSISTANCE

CIMBOX allows a quick remote connection with our service department for Knolval Cim-9750, by connecting to a wired or wireless network.

A local modem or the Hotspot of a smartphone can be easily used and get support all around the world where an internet connection is available.

KEY FEATURES

USB ports: 2× 2.0 + 2× 3.0 + 1x micro

Ethernet port: Gigabit Ethernet

Wi-Fi: Dual-band 802.11ac wireless network

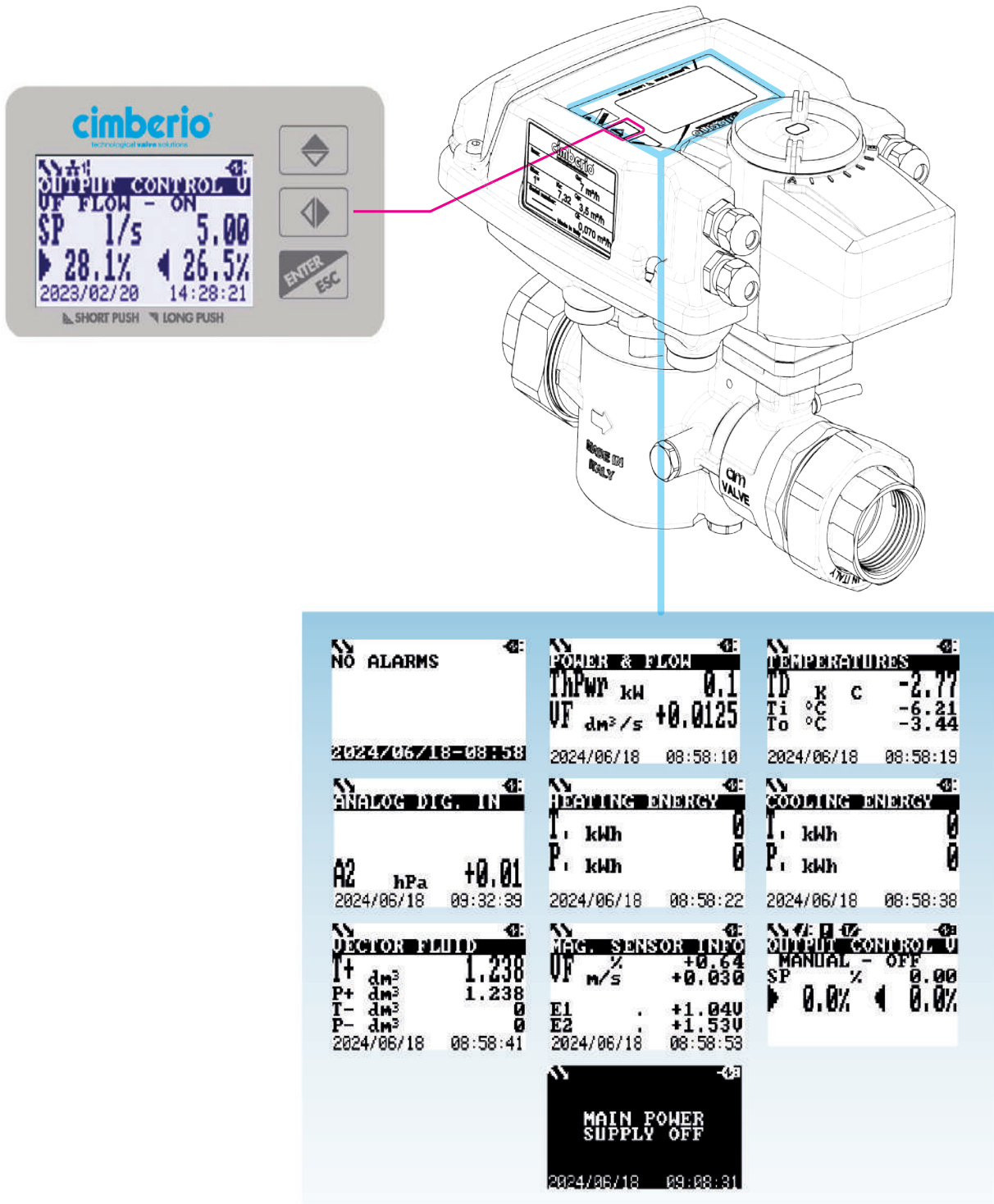
Power supply: min 2,5A (12,5W)/5V

Automatic Secure VPN

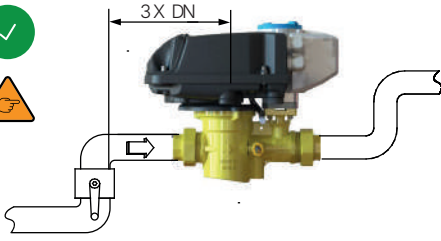
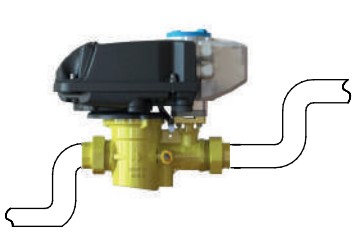
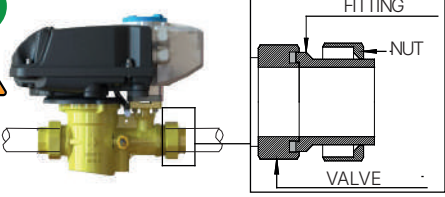
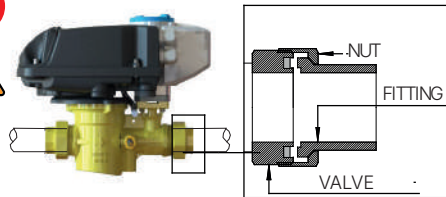


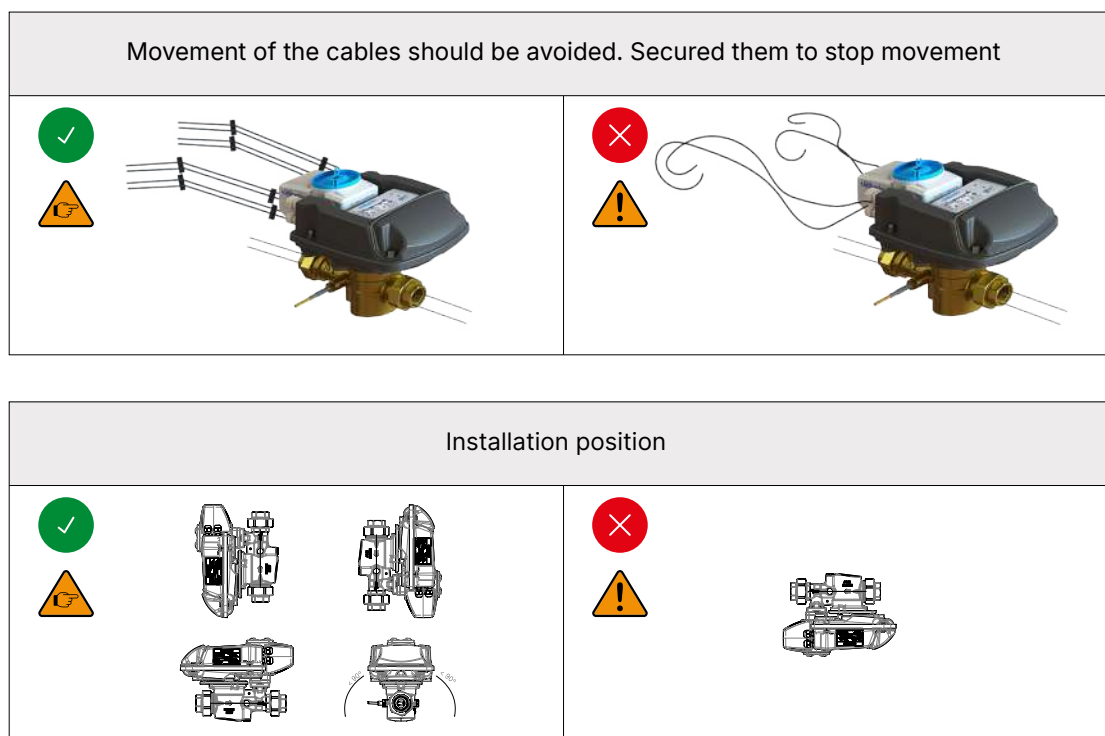
PAGES VISUALISATION

Different visualization possibilities by simply pressing of a key.



INSTALLATION RECOMMENDATIONS

In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer	
  	  
For installations in long pipe lines, please use anti vibration joints	
   ANTI VIBRATION JOINTS	   LONG PIPE
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty	
  	  
Install the sensor away from bends and hydraulic accessories	
   3X DN	  
Avoid positioning fittings by tightening the nuts	
   FITTING NUT VALVE	   NUT FITTING VALVE



Knolval Cim-9750 can be installed in either horizontal or vertical position. Avoid exposing the valves to constant installation stress caused by an imperfect alignment of pipes or by thermal deformation. Install the "partner valve" to the flow side of the heat exchanger (if Knolval Cim-9750 is on the return one). Screw the temperature probe in the dedicated fitting of partner valve. It is recommended that a strainer is installed to protect the devices from dirt coming from the hydraulic system. The water quality shall fulfill requirement of the standard UDI2035.

MAINTENANCE

The product usually does not require any type of maintenance.

Electric and hydraulic installation must be carried out by qualified personnel.

Installation shall be carried out in the absence of power supply.

If the entire valve, along with the electrical part, needs to be replaced make sure that the system is not pressurised and/or in exercise.

Do not use the valve as far as any part of it as a fixing point.

Remove any foreign bodies from the pipes and from the valve.

Provide special dirt separator filters for cleaning hydraulic system.

Do not cover electronic components and electric actuators with thermal insulating material to avoid overheating.

INSTALLATION: Pay attention to the direction of the water flow.

SYSTEM FILLING: Fill the system with the valves in the open position.

DISASSEMBLY: Remove power supply, remove pressure and let that the valve reach room temperature. Empty the system.

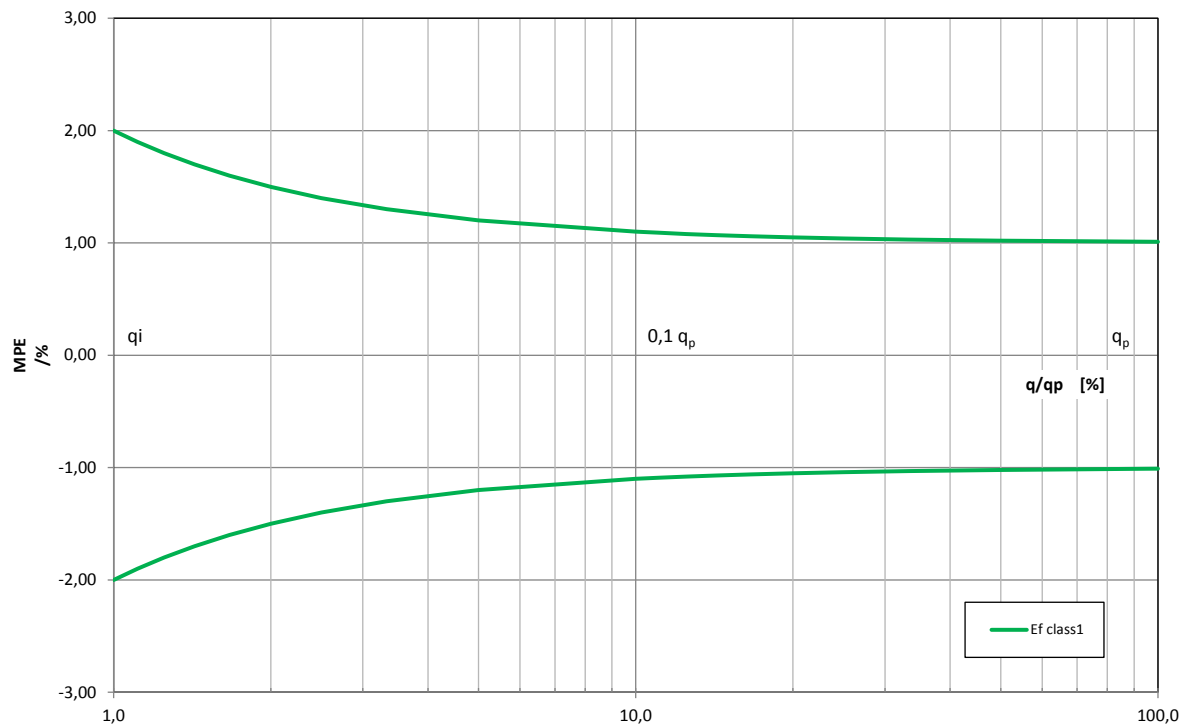
ATTENTION: Do not touch the hot parts without preventive protective measures in order to avoid burns!

WARNING: Do not install in systems that require features exceeding those of the product.

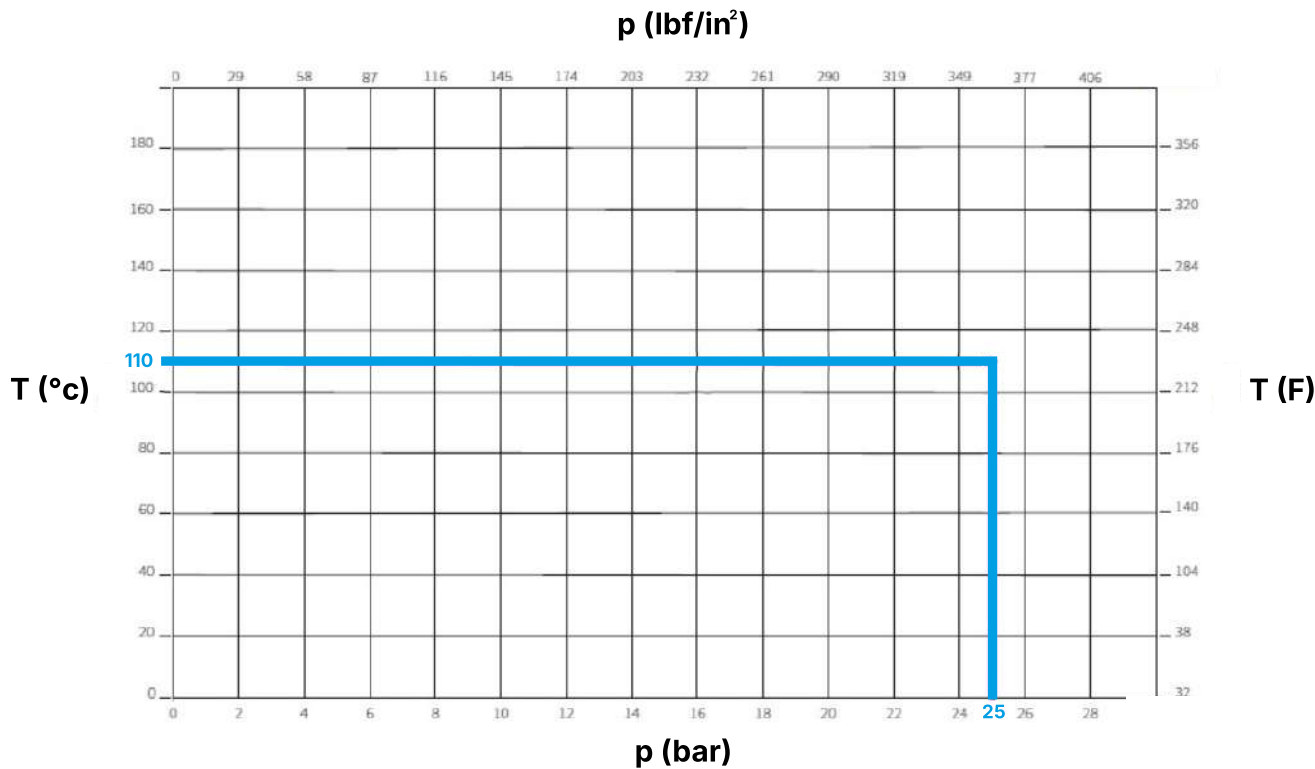
WARNING: Avoid installations where the valve can be exposed to corrosive environments and mechanical stresses that can cause damage.

ACCURACY

MI 004 - MPE - ACCURACY CLASS 2
(UNI EN 1434-1:2022)



P&T DIAGRAM



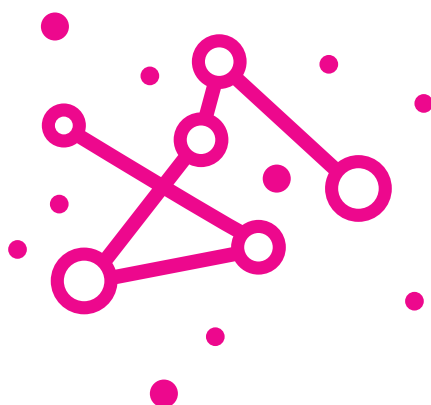
HOW TO ORDER

CIMBERIO	
Cod.	Description
Model	
9750	Regulation valve with integrated electromagnetic BTU meter
Approvals	
A	According to UNI EN 1434:2015 - CE/UKCA
M	MID - MI004 - 2014/32/EU
Display	
1	Blind version (without local user interface)
2	Graphic display 128 × 64 pixels with back light, nr. 3 touch keys.
Housing material	
A	PC/ABS housing sealable
Size	
0	DN15 / Thread 1/2" - Brass + Actuator
1	DN20 / Thread 3/4" - Brass + Actuator
2	DN25 / Thread 1"- Brass + Actuator
3	DN32 / Thread 1 1/4" - Brass + Actuator
4	DN40 / Thread 1 1/2" - Brass + Actuator
5	DN50 / Thread 2"- Brass + Actuator
Flow coefficient (Kv)	
A	Kv 1,6 (DN15)
B	Kv 1,7 (DN20 NO MID)
C	Kv 3,6 (DN15) - Kv 3,6 (DN20)
D	Kv 7,3 (DN25) - (DN32 NO MID)
E	Kv 12,7 (DN32)
F	Kv 35 (DN40) - (DN50)
Sensor body material / Electrode material / sealing material	
A	Sensor body in PEEK, Electrode in HC276, Sealing in FKM
I/O module - Analog	
1	Without Analog Input and Output
2	Nr. 1 Programmable 0-10 V / 0-22mA Input
I/O module - Digital	
A	Without Digital Input and Output
B	Nr. 1 Programmable Digital Input
C	Nr. 1 Programmable Digital Output
D	Nr. 1 Prog. Digital Input; nr. 1 Prog. Digital Output
User interfaces	
0	Without
Communication protocols	
A	Without Protocols
B	Ethernet port ONLY (FTPs, WEBS, NTPs, ...)
C	Modbus RTU (over RS485)
D	Modbus TCP (over Ethernet)
E	Modbus RTU + TCP (over RS485 + Ethernet)
F	Bacnet MS-TP (over RS485)
G	Bacnet IP (over Ethernet)
H	BACnet MS-TP or TCP - selectable by the customer - (over RS485 + Ethernet)
I	BACnet MS-TP + Modbus RTU - selectable by the customer - (over RS485)
L	Modbus TCP + BACnet IP (over Ethernet)
M	Modbus RTU + TCP + BACnet MS-TP or IP (over RS485 + Ethernet)
Z	Others

Temperature probes	
1	Without
2	DT2--PT500-2 wires-d. 5,2mm - 5m cable - 30° ... +120°C
3	DS type - PT500 - 2 wires - d. 5,2 mm - 3 m silicon cable - 30° ... +120°C
4	DS/PS type - PT500 - 2 wires - d. 5,2 mm - 3 m silicon cable - 30° ... +120°C
Power supply / Battery Back-Up / Data Logger	
A	24Vac/Vdc NOT ISOLATED - Without RTC backup - Without Data Logger
B	24Vac/Vdc NOT ISOLATED - With RTC Backup (Autonomy of 7 days) - NO Data Logger
C	24Vac/Vdc NOT ISOLATED - With RTC Backup (Autonomy of 7 days) - With Data Logger
Electrical connection	
1	White plastic Cable Glands
Special Features	
A	Without Special Features
Installation side	
1	T2 (To)- Outlet (Return)
2	T1(Ti) - Inlet (Forward)
Fluid	
A	No glycol
B	Etilenic glycol 20%
C	Etilenic glycol 25%
D	Etilenic glycol 30%
E	Etilenic glycol 40%
F	Propilen glycol 10%
G	Propilen glycol 20%
H	Propilen glycol 25%
I	Propilen glycol 30%
L	Propilen glycol 40%
Z	Other glycol or different %
Display resolution and Unit of measure	
1	KW - NO decimals
2	KW - ONE decimals
3	KW - TWO decimals
4	MW - NO decimals
5	MW - ONE decimals
6	MW - TWO decimals
7	GW - NO decimals
8	GW - ONE decimals
9	GW - TWO decimals
Language	
A	English
B	Italian
Customized settings	
0	None
1	Customized settings

Example of complete code for order

9750-A2A0AA2D0C3C1A1A3A0



cimberio®
technological **valve** solutions

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IMR 562637



FM 01820



N, 727



EMS 551553



OHS 551552



ENMS 577357