

COMBIFLOW Multi Rotary Actuator

Application

The COMBIFLOW Multi Rotary is a combined analogue and digital actuator designed to be used with the COMBIFLOW 6-way Pressure Independent Control Valve in 4-pipe applications.

The sizing flows can be programmed using BACnet or Modbus or by limiting the voltage or current signal to the actuator. The actuator can then be used for:

- Switching between cooling and heating.
- Flow modulation.
- Flow shut off.
- Error and status reporting.

When used as an analogue actuator, it communicates with the Building Management system (BMS) using a 0(2)-10 V or a (0)4-20 mA signal. When used as a digital actuator, it integrates with BACnet or Modbus systems, allowing simple configuration, feedback, flow and status indication.



Features

- High flexibility - one actuator covers many different control signals:
 - Analogue control signals: 0(2)-10 V, (0)4-20 mA
 - Digital control signals: BACnet MS/TP (RS485), Modbus RTU (RS485)
- Error and status reporting via BACnet or Modbus
- Single valve and actuator for flowrate modulation and switching between cooling and heating circuits
- Energy optimisation through optimum pressure independent flow limitation and regulation
- Modulating control for both cooling and heating
- Dew point sensor override functionality

Benefits

- Remote commissioning when used with BACnet or Modbus
- Remote flow setting via BACnet or Modbus
- Only one data point required to connect to the BMS
- No time-consuming commissioning required
- Full comfort without recommissioning should the system be extended during the construction phase
- Longer actuator life time due to pressure independent flow control where all pressure fluctuations are compensated by the valve's integrated DP controller
- Compact solution, and ideal for installations with height constraints

Approvals

- Conforms to: EMC directive 2014/30/EU Low voltage directive 2014/35/EU
- Protection class III
- Degree of protection IP54 (EN60529)
- RoHS 2011/65/EU



COMBIFLOW Multi Rotary Actuator

Technical data

Supply voltage:	24V AC/DC +/- 10 %
Frequency:	50/60 Hz
Power consumption:	
Operation:	5 VA/4 W AC/DC
Max consumption:	6.5 VA or 2 A@2ms*
Standby:	0.5 W
Protection class:	IP 54
Control signal analogue:	0(2)-10 V, (0)4-20 mA
Feedback signal:	0-10 V DC
Control signal digital:	BACnet MS/TP (RS485) Modbus RTU (RS485)
Torque:	5 Nm
Rotation angle:	90 °
Running time 90°:	45 s
Ambient conditions:	Temperature -20 °C - 50 °C Humidity 5-95 %RH
Cable gland:	PG9 (Not included)



Types and Operation Data

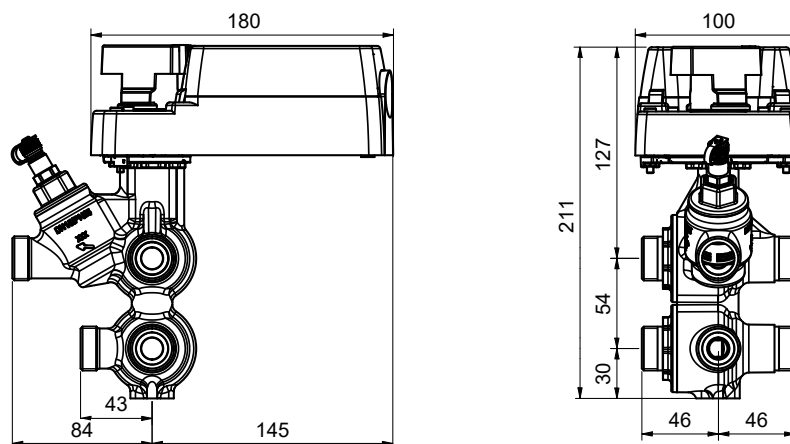
Frese no.	Valve dim.	Weight	Running time 90 °	Configuration	Cable length
48-5394	DN15-DN20	1.3 kg	45 s	Actuator with 6 flying wires + shield	1 m
48-5395	DN15-DN20	1.3 kg	45 s	Actuator without cable	-

*) Max consumption - for transformer sizing

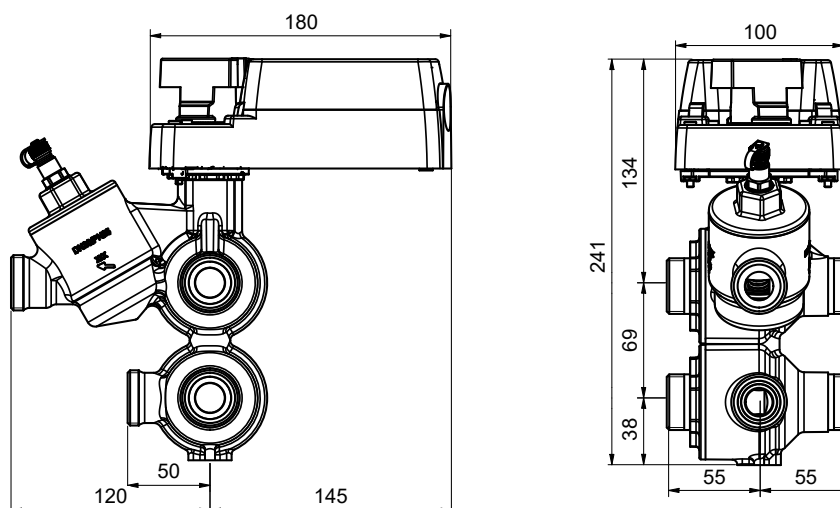
COMBIFLOW Multi Rotary Actuator

Dimensions

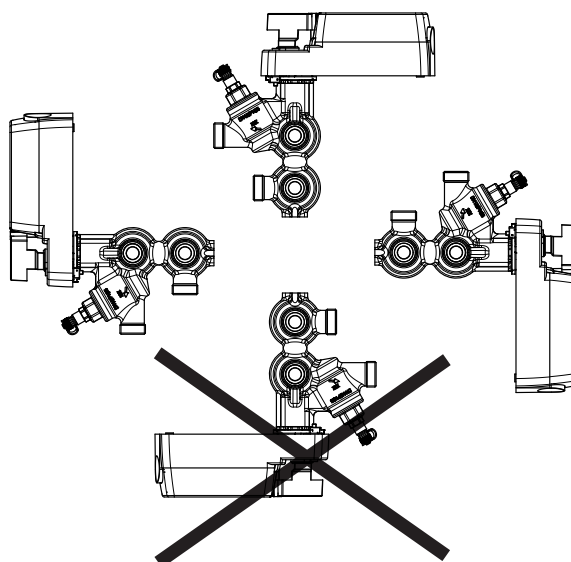
Mounted on
DN15 COMBIFLOW



Mounted on
DN20 COMBIFLOW



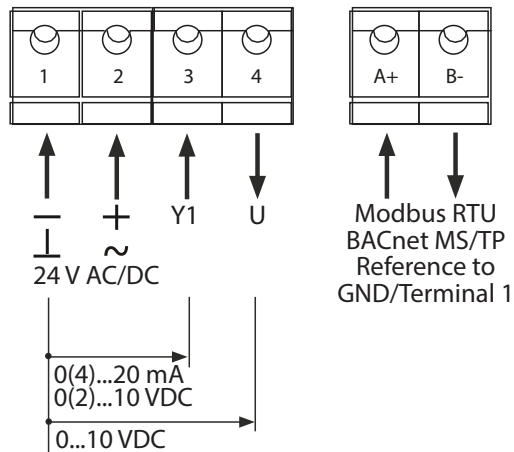
Mounting positions



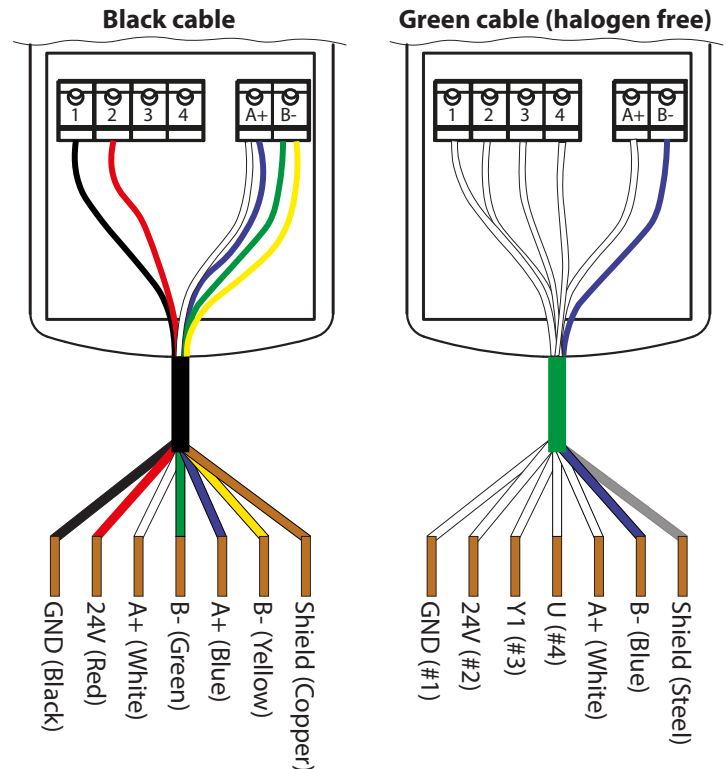
Modbus RTU
BACnet MS/TP
Reference to
GND/Terminal 1

COMBIFLOW Multi Rotary Actuator

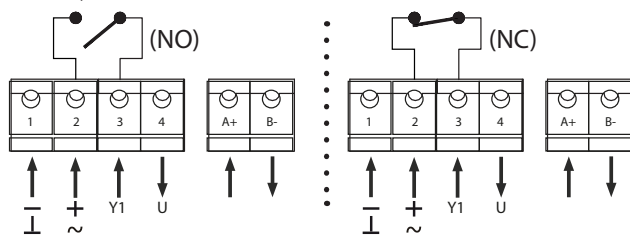
Electric wiring (Without cable - 48-5395)



Electric wiring (With cable - 48-5394)

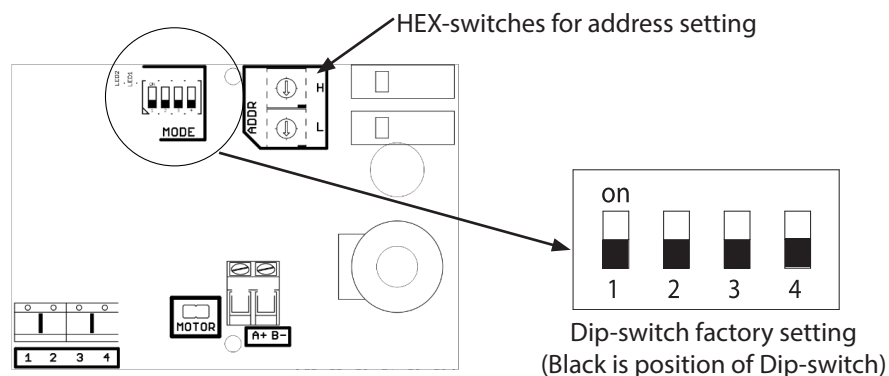


Dew point sensor/window contact



A normally open (NO) or normally closed (NC) dew point sensor or window contact (selectable in register DewPointSelect) can be connected to terminal 2 and 3. (Not supplied)

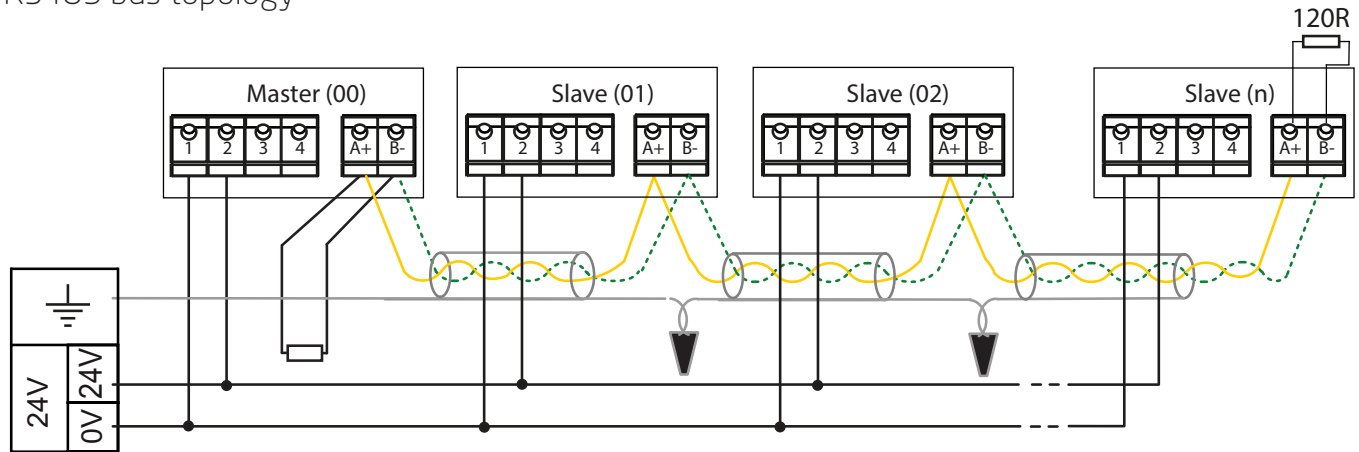
DIP Switch setting



DIP Switch	ON	OFF
1	Control signal range 2-10 V / 4-20 mA	Control signal range 0-10 V / 0-20 mA
2	Direction of rotation Counterclockwise	Direction of rotation Clockwise
3	Control signal selection Current signal (mA)	Control signal selection Voltage signal (V)
4	Communication mode BACnet MS/TP	Communication mode Modbus RTU

COMBIFLOW Multi Rotary Actuator

RS485 bus topology



Please note:

Maximum number of RS-485 devices on the line can be up to 32 devices.
A repeater is required if more than 32 devices are connected.

BUS communication

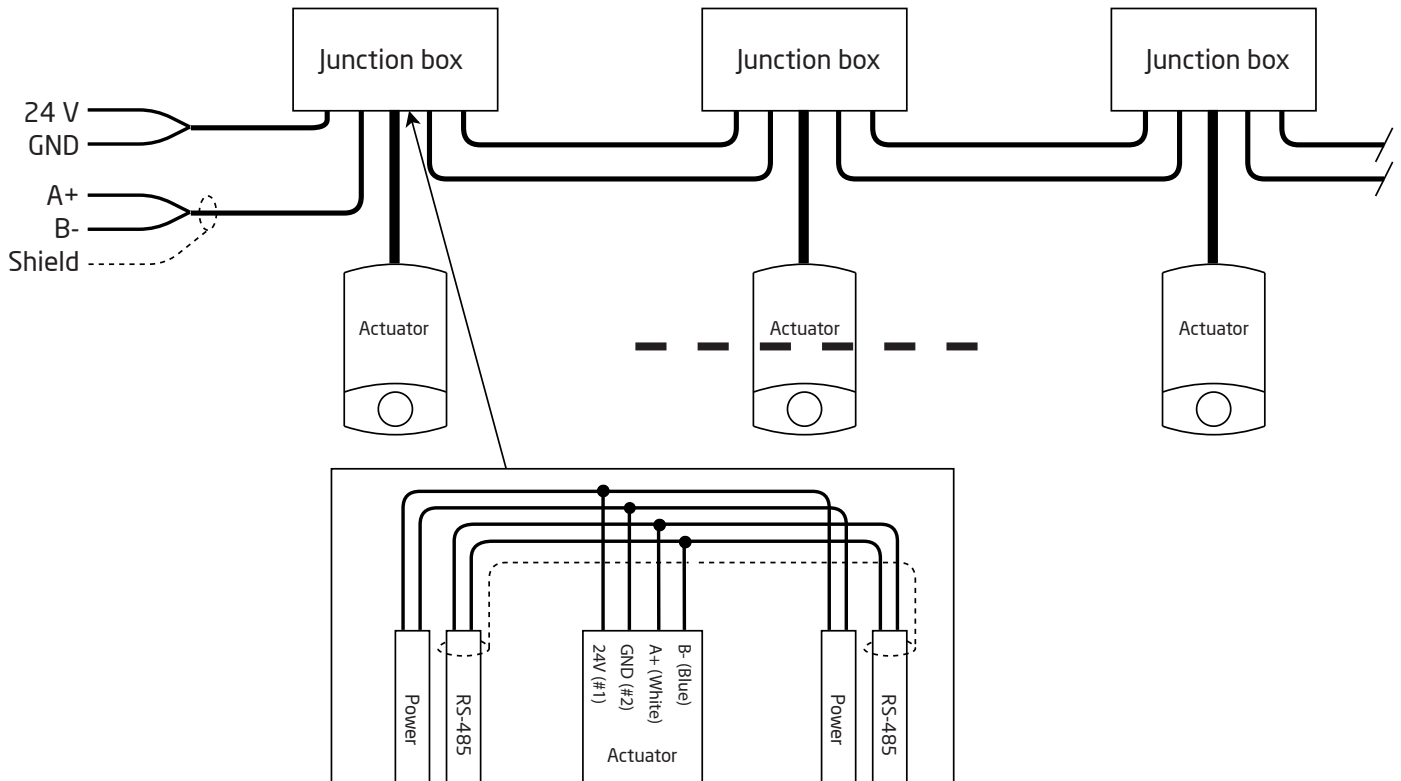
Interface	EIA-485 / RS-485*	
Transmission type	Modbus RTU & BACnet MS/TP**	
Supported baud rates	9600, 19200** , 38400, 57600, 115200 bps	
Start/stop bits	8N1(default BACnet), 8E1 (default Modbus), 8N2, 8E2, 8O1, 8O2	
Number of bus participants	Up to 32 recommended, max. 64	
Bus load	1/8 unit load	
Termination	Mount 120 Ohm resistance (See diagram above)	
Bias network	To be set in the master	
Recommended cable	Twisted-pair cable with shielding (characteristic impedance approx. 120 ohm)	
For bus topology with 115,200 baud	Recommended maximum cable length 500 m	
For bus topology with 38,400/57,600 baud	Recommended maximum cable length 750 m	
For bus topology with 9,600/19,200 baud	Recommended maximum cable length 1000 m	
Stub lines	Max. line length 2 m	
Supported modbus function codes	Code	Function
	0x03	Read Holding Register
	0x06	Write Holding Register
	0x10	Write Holding Multiple

*) The wiring of BACnet MS/TP or Modbus RTU (RS-485) must be carried out in accordance with applicable standard ANSI/TIA/EIA-485-A-1998.

**) Default setting

COMBIFLOW Multi Rotary Actuator

Network connection with junction box, 48-5394 Daisy chain solution



Technical Specification Text

- Remote digital flow setting of the valve shall be possible via BACnet or Modbus connection to the BMS
- Remote analogue flow setting of the valve shall be possible via a 0(2)-10 V or (0)4-20 mA input signal from BMS
- The power supply to the actuator shall be 24 V AC/DC
- The actuator shall be capable of providing a 0-10 V feedback signal.
- Protection class for the actuators shall be IP 54 according to EN 60529

Maintenance

The COMBIFLOW Multi Rotary Actuator is maintenance-free. Disconnect the electrical connections from the terminals if you want to work at the device.

Environmental compatibility

The product environmental declaration A6V10209938 contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.



Note

Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Frese A/S assumes no responsibility for errors, if any, in catalogues, brochures, and other printed matter. Frese A/S reserves the right to modify its products without prior notice, including already ordered products, if this does not alter existing specifications. All registered trademarks in this material are the property of Frese A/S. All rights reserved.

Frese A/S
Tel: +45 58 56 00 00
info@frese.dk