Data sheet

NovoCon® S Digital/Hybrid - High Accuracy Actuator

Description



NovoCon® S Digital/Hybrid is a high accuracy multi-function actuator, specifically designed for use in combination with Pressure Independent Balancing Control Valve type AB-QM in sizes from DN 10-32.

The high position accuracy of the actuator, together with the pressure independent and linear characteristic of AB-QM valve, allow NovoCon® S Digital/Hybrid to be used as flow indicator.

Setup of actuator and valve parameters is made via fieldbus. Control is made via analog inputs or field bus for NovoCon® S Hybrid. NovoCon® S Digital is controlled via field bus.

The actuator with AB-QM is used to control water supply to fan coil units, chilled beams, induction units, small re-heaters, re-coolers, AHU's and other terminal units for zone control in which hot/cold water is the controlled medium. Due to its accuracy, remote functionality and flow indication features can significantly add to an accelerated commissioning process, easy maintenance, improved indoor comfort, energy saving and fair allocation of heat/cool energy.

Main features:

- BACnet: B-ASC (BACnet Application Specific Controller)
- Remote commissioning/Reset/Flush features
- Flow indication
- High position accuracy
- LED bar displaying status
- No tools required for mounting
- Maintenance-free during lifetime
- Self-positioning process
- Low-noise operation
- Plug-in halogen free cables
- Auto MAC addressing
- Auto baud rate detection
- Intrinsic alarm reporting
- Valve blockage alarm
- Broken wire detection on analog control and ground signal
- Mis-wiring protection on any wire up to 30 V

Ordering

Type	Code No.
NovoCon® S Hybrid	**003Z8500**
NovoCon® S Digital	**003Z8501**

Accessories

Type	Length	Connections	Code No.
Cable NovoCon® Digital	1.5 m	bus / power	**003Z8600**
Cable NovoCon® Digital	5 m	bus / power	**003Z8601**
Cable NovoCon® Digital	10 m	bus / power	**003Z8602**
Cable NovoCon® Digital, daisy chain	1.5 m	actuator / actuator	**003Z8603**
Cable NovoCon® Digital, daisy chain	5 m	actuator / actuator	**003Z8604**
Cable NovoCon® Digital, daisy chain	10 m	actuator / actuator	**003Z8605**
Cable NovoCon® Analog	1.5 m	0-10 V / power / voltage booster	**003Z8606**
Cable NovoCon® Analog	5 m	0-10 V / power / voltage booster	**003Z8607**
Cable NovoCon® Analog	10 m	0-10 V / power / voltage booster	**003Z8608**

Note! Cables are not included with actuator and must be ordered separately.

Approvals

CE EMC Directive 2004/108/EC, EN 60730-2-14:1997, EN 60730-2-14/A1:2001, EN60730-1:2011
RoHS Directive 2011/65/EU

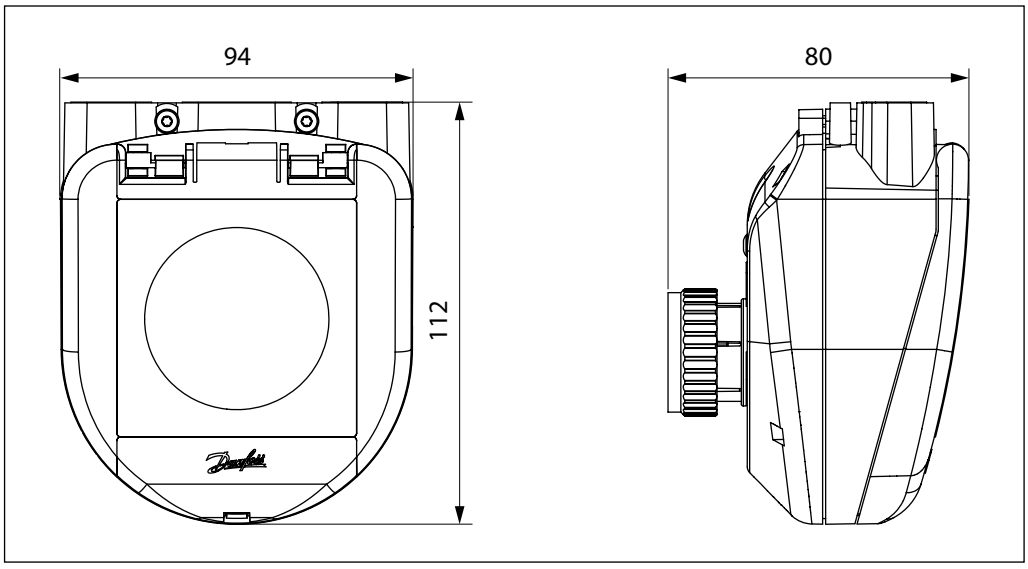
Technical data

Power supply range	24 V AC/DC, ± 25%, 50 / 60 Hz
Power consumption	Running: 3.25 VA / Standby: 0.8 W
Protection class	III safety extra-low voltage
Electrical connection	Halogen free cable
Control options	LOG / MDF (alpha setting controlled)
Control signal NovoCon® S Hybrid	0-10 VDC, 0-5 VDC, 2-10 VDC, 5-10 VDC, 2-6 VDC, 6-10 VDC, 0-20 mA, 4-20 mA, BACnet MS/TP
Control signal NovoCon® S Digital	BACnet MS/TP
Actuator speed selections (*open to close*)	3 sec/mm, 6 sec/mm, 12 sec/mm, 24 sec/mm, Constant Time
Stroke	6 mm
Force	90 N
Position accuracy	± 0.05 mm
Ambient temp. range	–10° C to 55° C
Max. medium temp.	120° C
Storage temp. range	–40 to 70 °C
Grade of enclosure	IP 54 (IP 40 upside down)
Weight	0.4 kg

BACnet data

Type	Length
BACnet device profile	BACnet Application Specific Controller (B-ASC)
BACnet protocol	BACnet Master Slave / Token Passing (MS/TP)
BACnet baud rates supported	Auto baud rate detection / 9600 bps / 19200 bps / 38400 bps / 56700 bps/ 76800 bps / 115200 bps

Dimensions



Presetting

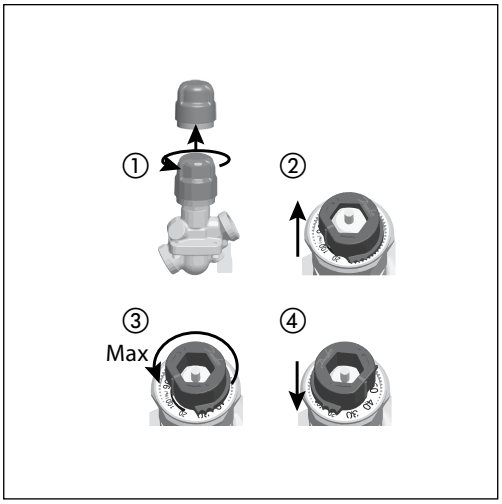
Preset of flow is made electronically with the NovoCon® S Digital/Hybrid actuator. Preset on the AB-QM valve is not used under normal operation.

Normal operation

Leave valve at default factory preset (100 %).

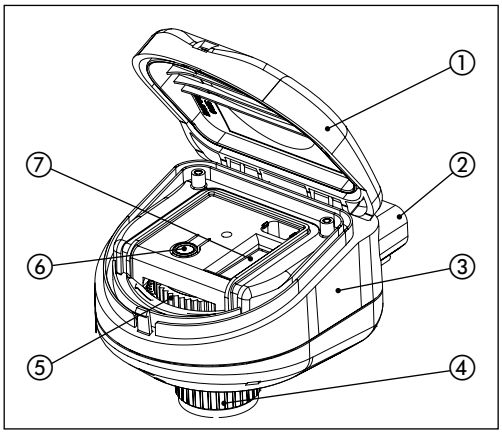
High flow operation

In order to achieve a more efficient flush and enable presetting of valve of more than 100% it is recommended to manually preset AB-QM valve to maximum flow. This is done by turning the preset scale counter-clockwise until it stops. *See drawing.*
NovoCon® S Digital/Hybrid in high flow operation enables presetting of AB-QM DN 10-20 up to 120% and DN 25-32 up to 110%.



Design

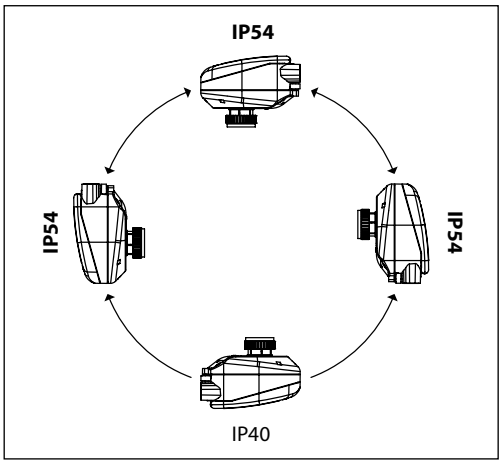
① Removable lid
② Bus and power connection
③ LED window
④ Locking ring
⑤ Manual override
⑥ Reset button
⑦ DIP switches



Mounting Orientation

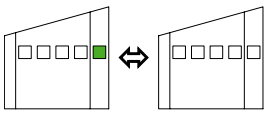
NovoCon® S Digital/Hybrid can be mounted in any position, however mounting orientation affects the IP classification, see illustration.

Note!
IP classification is only valid when cable or plugs are present in all connections.

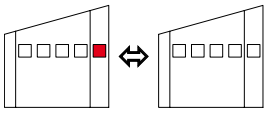


LED Display

BACnet(RS485) activity

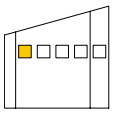


BACnet(RS485) activity
No light from LED: Actuator sees no activity on the network
LED turn on and off quickly: Normal operation on the network communication is OK

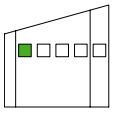


BACnet(RS485) activity with ERRORS
LED turns on and off slowly with RED color: Actuator sees activity, but with errors.
LED turn on and off quickly with RED color: Communication is OK, EXCEPT that another device may be using the same MAC address

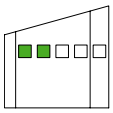
Position of valve/actuator



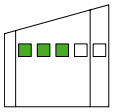
AB-QM valve is **fully closed.**



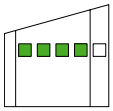
AB-QM is 1-24% open.



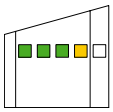
AB-QM is 25-49% open.



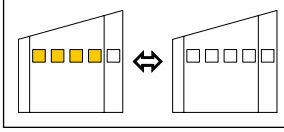
AB-QM is 50-74% open



AB-QM is 75-99% open.



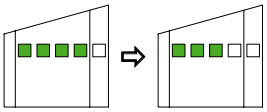
AB-QM valve is **fully open**.



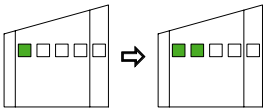
Flush is active
All LEDs turns on/off with specific period.

LED Display

Movement of valve/actuator



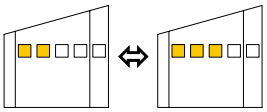
NovoCon® S closes the valve
All green LEDs are turned ON, then turned OFF one at the time (repeatedly).



NovoCon® S opens the valve
All green LEDs are turned OFF, then turned ON one at the time (repeatedly).

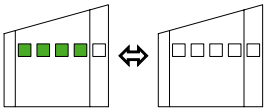


Calibrating
Green light moves forward and backwards, one by one.

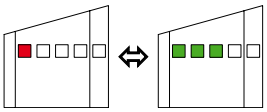


De-air is active
Yellow LEDs are turned ON one by one, then turned OFF one by one (repeatedly).

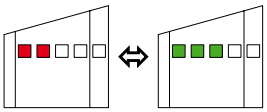
Information from actuator



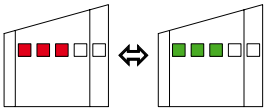
Blinking function, all green LEDs turns on/off for a specific period. Used to physically identify individual actuator on the bus.



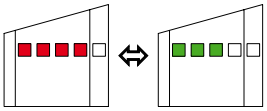
Error during closing
LEDs change between showing the alarms and showing normal operation. Debris might be trapped under the valve cone. Flushing might solve the problem.



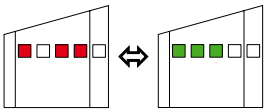
Temperature inside actuator is out of the recommended range
LEDs change between showing the alarms and showing normal operation. Ambient temperature has likely exceeded 60°C.



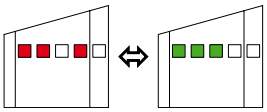
Internal error
LEDs change between showing the alarms and showing normal between operation. Try:
A: Re-calibrate.
B: Turn power off and on.
C: If the error does not disappear actuator replacement can be necessary.



Error during calibration
LEDs change between showing the alarms and showing normal operation. Verify if the NovoCon® S is correctly attached to the valve and recalibrate.



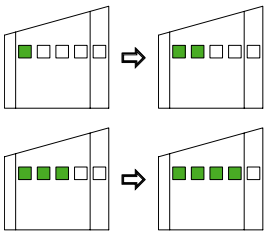
Power supply is outside limits
LEDs change between showing the alarms and showing normal operation. Use analog cables as voltage booster.



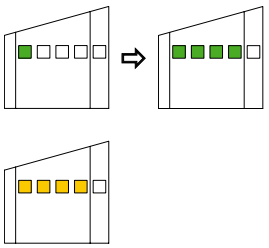
No Control Signal
In analog mode is it detected that the control wire is broken.
In digital mode is it detected that there has been no update of the Desired Flow Rate input for more than the specified time in AV:3 (Control fall back timeout).

LED Display

Pressing the reset button during normal operation



Calibration/Reset/Flush
When the reset button is pressed all LEDs are turned off.
Keep pressing the reset button for
1 second: 1 LED ON
2 seconds: 2 LEDs ON = Start calibration (Reset).
3 seconds: 3 LEDs ON
4 seconds: 4 LEDs ON = Start flushing.
5 seconds or more = Return to normal operation.



Factory reset - reset to default settings
When the reset button is pressed during power up all LED's are turned off.
Keep pressing the reset button for
4 seconds: 4 LEDs ON = Reset to default settings.
6 seconds or more = Return to normal operation.

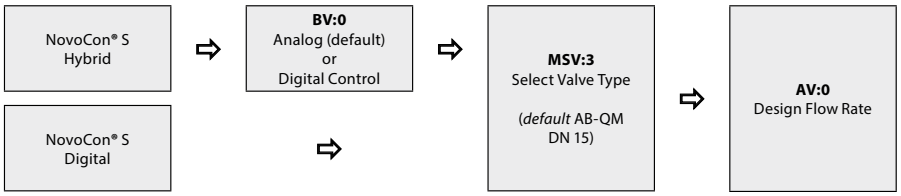
When factory reset is performed it is shown by:
1 short flash with all yellow position LED's.
Note that all settings will be reverted to factory settings.

NovoCon® S and BACnet - Presetting

General

There are simple BACnet settings essential to the basic setup configuration of NovoCon® S Digital/ Hybrid in order to communicate and control. These are contained in the BACnet objects.

BACnet presetting



Auto MAC Addressing:

The NovoCon® S actuator observes for used MAC addresses on the network and automatically assign an available MAC address to the actuator. If a MAC address collision appears later and Auto MAC addressing is enabled this function will start the search for a free MAC addresses again. When a free MAC address is found an "I-Am" notification will be sent out via BACnet.

Auto baud rate:

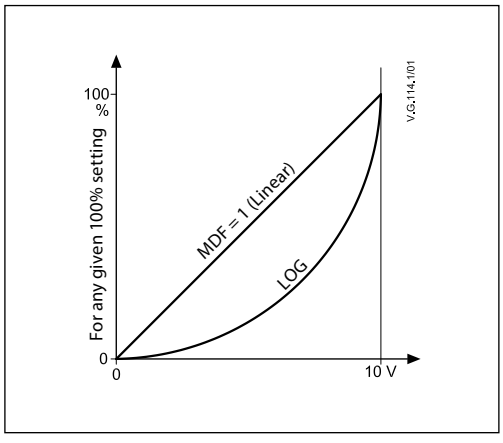
If the NovoCon® S observes activity on the bus within 45 seconds after powering up, then it adapts to the baud rate presently used on the network. If the actuator does not see activity on the network within this time, it generates a token and sends this out at the default baud rate of 38400bps.

BACnet Objects
- Analog Value

Ident	Object / Parameter name	Unit	Read/ Write	Min	Max	Default	Resolution	Description
AV:0	Design Flow Rate	%, L/hr, GPM	R/W	20% of nominal flow	Setting Range Maximum from Valve table	Nominal value from the Valve table in L/hr	0.1	Preset value for the design flow when control signal is at 100%. Unit follows BV:4
AV:1	Desired Flow Rate input	%, L/hr, GPM	R/W	0	100% or Design Flow value	0%	0.01	The desired flow rate through the valve. Unit follows BV:5
AV:2	Actual Flow Rate feedback	%, L/hr, GPM	R	0	If L/hr (GPM) is selected in BV:4 then the valve flow rate is set to the selected valve's (MSV:3) maximum value. Otherwise 100%	na	0.001	Flow rate indication based on the position of the Actuator stem. Unit follows BV:4
AV:3	Control Fallback Time	Minutes	R/W	0	60	10	1	Time before actuator reacts to a missing control signal.
AV:4	Alpha Value	na	R/W	0.05	1.0	1.0	0.01	Value used for shaping the curve in Manual Defined Function (MDF) mode to fit the characteristic curve of a heat exchanger. Linear setting: MDF=1. See curve below table.
AV:5	Valve closing or opening time	Seconds	R/W	18	700	na	1	The time the actuator needs to move from 0% to 100% of Design Flow.
AV:6	Rectified voltage measured by the actuator	Volts	R	12	50	0	0.01	Rectified voltage which powers the actuator.
AV:7	MAC Address	na	R/W	1	127	na	1	MAC Address used for BACnet communication.
AV:8	Temperature In the Actuator	°C	R	-20	100	na	0.5	Temperature measured inside the actuator.
AV:9	Total Operating Hours	Hours	R	0	MAX	na	1	Total Operating Hours of the actuator.
AV:10	Minutes since last power-up	Minutes	R	0	MAX	na	1	Minutes since the last power-up of the actuator.
AV:11	Minutes since last calibration	Minutes	R	0	MAX	na	1	Minutes since the last time the actuator was calibrated to a valve.
AV:12	Minutes since fully closed	Minutes	R	0	MAX	na	1	Minutes since the last time the valve was fully closed.
AV:13	Minutes Since Fully Opened	Minutes	R	0	MAX	na	1	Minutes since the last time the valve was fully opened.
AV:21	The name of the User Defined Valve is shown here	L/hr or GPM, Unit type comes from Valve Table	R	na	na	na	1	Nominal flow of the selected valve type.
AV:22	Valve position at nominal flow	Millimetre	R	na	na	na	1	Position in mm for nominal flow of the selected valve.
AV:23	Maximum value for the Design Flow Rate	Unit type follows BV:4 selection: % or (L/hr or GPM)	R	na	na	na	1	Maximum level the Design Flow can be increased to for the selected valve.
AV:24	The name of the User Defined Valve is shown here	L/hr or GPM, Unit type written here is copied to the Valve Table. Default: L/hr	R/W	1	5000	450	0.1	Name and Nominal Flow for the User Defined Valve.
AV:25	Valve position at nominal flow for User Defined Valve	Millimetre	R/W	1.5	5.8	2.25	0.01	Position in mm for nominal flow of the User Defined Valve.
AV:26	Maximum value for the Design Flow in the User Defined Valve	Unit type follows BV:4 selection: % or (L/hr or GPM)	R/W	100	150	120	1	Maximum level the Design Flow can be increased to for the User Defined Valve.

Note! Units L/hr and GPM are decided by the valve selection.

AV:4 Alpha Value Curve



BACnet Objects - Binary Value

Ident	Object / Parameter name	Read/ Write	Active Text	Inactive Text	Default	Description
BV:0 [1]	Analog or Digital control	R/W	Analog	Digital Control	Hybrid: Default is analog. Digital, the only option is Digital control.	Selects between analog or digital control of the flow.
BV:1	LOG or Manual Defined Function (MDF) mode	R/W	LOG	MDF (controlled by Alpha Value)	LOG	Selection of LOG or MDF (controlled by Alpha Value) mode.
BV:2	Direct or Inverse operation Mode	R/W	Inverse	Direct	Direct	Select here between Direct and Inverse operation mode.
BV:4	Units used to set and display the Design Flow	R/W	%	L/hr or GPM for ANSI version	L/hr or GPM for ANSI version	Units used to set and display the Design Flow.
BV:5	Units used to set and display Desired Flow Rate	R/W	%	L/hr or GPM for ANSI version	%	Units used to set and display the desired Flow.

[1] Only valid for NovoCon S Hybrid

BV:10	Warning: Temperature of the actuator is out of recommended range	R	ON	OFF	na	The Temperature inside the Actuator is out of the recommended range.
BV:11	Alarm: No Control Signal	R	ON	OFF	na	The actuator has detected that it has no control signal in.
BV:12	Alarm: Error during Closing	R	ON	OFF	na	Actuator can't close the valve completely.
BV:14	Warning: Voltage of power supply is too high	R	ON	OFF	na	Voltage of power supply is measured to be too high.
BV:15	Warning: Voltage of power supply is too low	R	ON	OFF	na	Voltage of power supply is measured to be too low.
BV:16	Alarm: Error during Calibration	R	ON	OFF	na	There was an error during calibration of actuator.
BV:17	Warning: BACnet MAC-address Conflict was Detected	R	ON	OFF	na	Two or more devices on the BACnet have the same MAC-address.
BV:18	Warning: Faults on the BACnet was detected	R	ON	OFF	na	Problems with communication on the network are detected.
BV:19	Warning: Invalid DIP switch setting	R	ON	OFF	na	MAC address assignment was set to DIP-switches, but is incorrectly set to either 0 or 127.
BV:20	Alarm: An internal Error has been detected	R	ON	OFF	na	Re-calibrate or power cycle actuator to reset - actuator replacement can be necessary

BACnet Objects - Multi State Value

Ident	Object / Parameter name	Read/ Write	State Text	Number Of States	Default State	Description
MSV:0	Actuator Mode and special features	R/W	1: Normal 2: Calibration 3: Flush 4: De-Air 5: Alarm	5	1: Normal	Shows present mode of actuator. Calibration, flushing and de-air can be started from here.
MSV:1 [1]	Analog Control signal type and range	R/W	1: 0-5 VDC 2: 0-10 VDC 3: 2-10 VDC 4: 5-10 VDC 5: 2-6 VDC 6: 6-10 VDC 7: 0-20 mA 8: 4-20 mA	8	2: 0-10 VDC	Used to select the analog control input type and range.
MSV:2	Missing Control Signal Fallback Action	R/W	1: No action 2: CLOSE 3: OPEN 4: Go to 50% of Design Flow	4	1: No action	What the actuator shall do if control signal is lost.
MSV:3	Selected Valve Type	R/W	See table "Valve Type Selection"	17	4: AB-QM DN 15	This is the valve type. The actuator is set-up to control.
MSV:4	Actuator Speed	R/W	1: 3 sec/mm 2: 6 sec/mm 3: 12 sec/mm 4: 24 sec/mm 5: Constant Time	5	4: 24 sec/mm	Amount of time for actuator to move 1mm or alternatively selection of a constant time.
MSV:5	MAC Address assignment method	R/W	1: Auto-Address Detection 2: DIP Switch Settings 3: User configuration over BACnet	3	1: Auto-Address Detection	Selection of method to set MAC Address for BACnet communication.
MSV:6	Baud Rate	R/W	1: Auto Baud Rate Detection 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps 6: 76800 bps 7: 115200 bps	7	1: Auto Baud Rate Detection	Baud Rate used for BACnet communication.
MSV:7	LED Control	R/W	1: Normal LED mode 2: Show only alarms 3: All LED's OFF 4: Blink	4	1: Normal LED mode	Select here the usage of the LED's for example Normal or Blink or all OFF.

[1] Only valid for NovoCon S Hybrid

BACnet Objects - Analog Input

Ident	Object / Parameter name	Unit	Resolution	Description
AI:0 [1]	Voltage(V) or Current(mA) level measured on the analog control input	Volt / mA	0.001	Voltage or Current control signal measured by the actuator

[1] Only valid for NovoCon® S Hybrid

BACnet Objects - Notification class

Ident	Object / Parameter name	Description
NC:0	Alarm Notifier, Subscribe here for alarms	Subscribe here devices for receiving alarms

NC:0 is an object where other BACnet devices can subscribe to be informed directly from this device if an alarm or warning is set or cleared. A maximum of 4 devices can subscribe to this service. Subscribers of this object will be informed if one of the Warning or Alarms BV:10 to BV:20 is set or cleared.

BACnet Objects - Averaging

Ident	Object / Parameter name	Min. Value	Average value	Max. Value	Window Interval	Window Sample	Description
AVO:0	Average rectified voltage measured by the actuator	Updated according to actual measurements			1 Day	24	Average of the rectified voltage which powers the actuator.

Valve Type Selection



Values for flow are only valid for water applications

Index	Name	Nominal Flow	Units	Valve position for nominal flow [mm]	Setting Range Maximum [%]
1	AB-QM ISO DN 10LF	150	L/hr	2.25	120
2	AB-QM ISO DN 10	275	L/hr	2.25	120
3	AB-QM ISO DN 15LF	275	L/hr	2.25	120
4 [1]	AB-QM ISO DN 15	450	L/hr	2.25	120
5	AB-QM ISO DN 20	900	L/hr	2.25	120
6	AB-QM ISO DN 25	1700	L/hr	4.5	110
7	AB-QM ISO DN 32	3200	L/hr	4.5	110
8	AB-QM ANSI DN ½" LF	1.2	GPM	2.25	100
9	AB-QM ANSI DN ½"	2	GPM	2.25	100
10	AB-QM ANSI DN ½" HF	5	GPM	4	100
11	AB-QM ANSI DN ¾"	4	GPM	2.25	100
12	AB-QM ANSI DN ¾" HF	7.5	GPM	4	100
13	AB-QM ANSI DN 1"	7.5	GPM	4.5	100
14	AB-QM ANSI DN 1" HF	12	GPM	4.5	100
15	AB-QM ANSI DN 1¼"	14.1	GPM	4.5	100
16	AB-QM ANSI DN 1¼" HF	17.5	GPM	4.5	100
17 [2])	"User Defined Valve"	NF	UF	VPNF	SRM

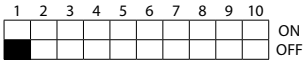
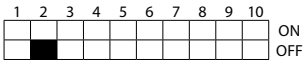
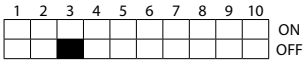
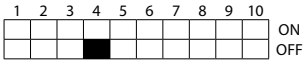
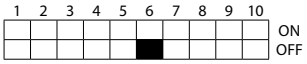
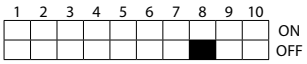
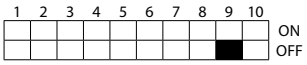
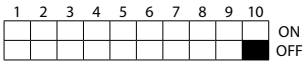
[1] Default
[2] Default values are identical to AB-QM ISO DN 15

BACnet BIBBs

Service	BIBBs	Init/Exe
ReadProperty	DS-RP-B	exe
WriteProperty	DS-WP-B	exe
Who-Is	DM-DDB-A	init
Who-Is	DM-DDB-B	exe
I-Am	DM-DDB-B	init
I-Am	DM-DDB-A	exe
Who-Has	DM-DOB-B	exe
I-Have	DM-DOB-B	init
DeviceCommunicationControl	DM-DCC-B	exe
ReinitializeDevice	DM-RD-B	exe
ConfirmedEventNotification	AE-N-I-B	init
UnconfirmedEventNotification	AE-N-I-B	init
AcknowledgeAlarm	AE-ACK-B	exe

DIP Switch Settings

For manual MAC addressing using DIP Switches BV:5 must be set to: DIP Switch Settings

DIP Switch	Configuration name	OFF state (default)	ON state	SW bit field name
1. 	BACnet address bit 0	Logic '0'	Logic '1'	bacnet_addr (bit 0)
2. 	BACnet address bit 1	Logic '0'	Logic '1'	bacnet_addr (bit 1)
3. 	BACnet address bit 2	Logic '0'	Logic '1'	bacnet_addr (bit 2)
4. 	BACnet address bit 3	Logic '0'	Logic '1'	bacnet_addr (bit 3)
5. 	BACnet address bit 4	Logic '0'	Logic '1'	bacnet_addr (bit 4)
6. 	BACnet address bit 5	Logic '0'	Logic '1'	bacnet_addr (bit 5)
7. 	BACnet address bit 6	Logic '0'	Logic '1'	bacnet_addr (bit 6)
8. 	Termination resistor (120Ω)	No termination	Termination resistor enabled [1]	
9. 	Not used			
10. 	Not used			

[1] The actuator possesses resistors which can be switched on in the last actuator on the bus for correct termination of the bus.

DIP Switch Settings - Manual Addressing

MAC address is set by DIP switch 1 to 7.
0 = OFF, 1 = ON

DIP switch 1, 2, 3, 4																DIP switch 5,6,7
0000	1000	0100	1100	0010	1010	0110	1110	0001	1001	0101	1101	0011	1011	0111	1111	
0*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	**000**
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	**100**
32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	**010**
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	**110**
64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	**001**
80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	**101**
96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	**011**
112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127*	**111**

** Addresses no. 0 and 127 must not be used.*

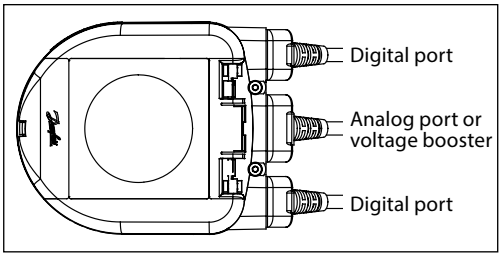
Example

Setting MAC address to 37:

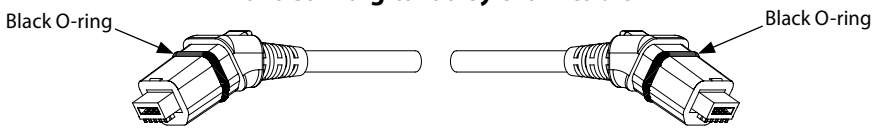
DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7
ON	OFF	ON	OFF	OFF	ON	OFF

Wiring

The wiring of BACnet MS/TP (*RS485*) must be carried out in accordance with applicable directives.
All BACnet bus connections in the cables are made with twisted wires.
Galvanic separation shall be provided for segments crossing buildings.
Common ground shall be used for all devices on the same network inclusive router, gateways etc.

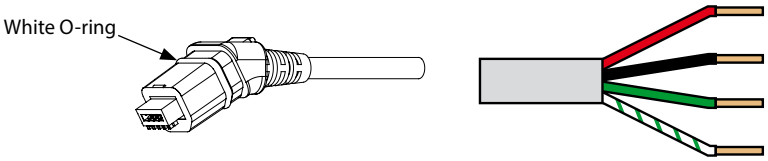


NovoCon® digital daisy chain cable



The digital daisy chain cable is used to connect power and BACnet between two NovoCon® S devices.

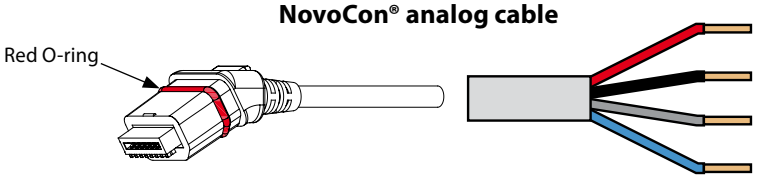
NovoCon® digital cable



Red:	*Power*
Black:	*Common ground for power and bus signal wire*
Green:	*'+' non-inverting signal wire*
Green/White:	*'-' inverting signal wire*

The digital cable is used to connect NovoCon® to other BACnet devices.

NovoCon® analog cable



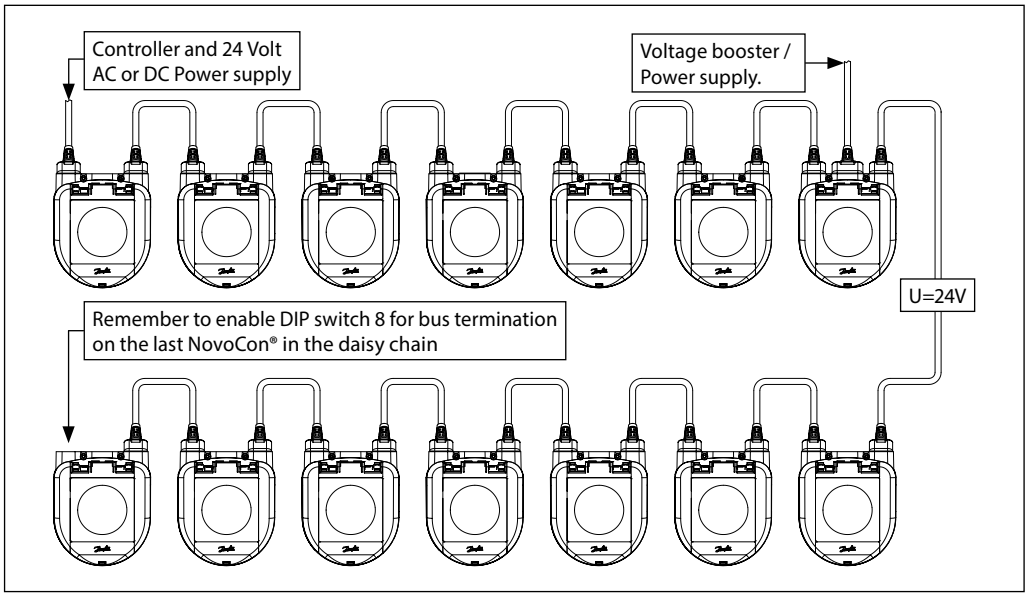
Red:	*Power*
Black:	*Power Ground*
Grey:	*Analog input*
Blue:	*Analog input ground*

The analog cable is used to connect power and analog control signal.
Optional the analog cable can be used as a voltage booster for NovoCon® S in daisy chain connections.

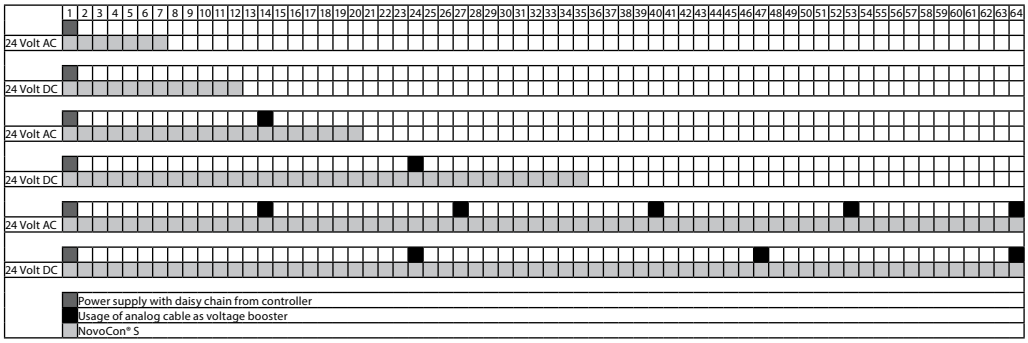
Daisy chain

If the quantity of NovoCon® S Digital/Hybrid in daisy chain connection with a 24V AC power supply, exceeds 7 pcs. then additional power is needed.

If the quantity of NovoCon® S Digital/Hybrid in daisy chain connection with a 24V DC power supply, exceeds 12 pcs. then additional power is needed.



In case all BACnet devices are NovoCon® S, please see some examples for usage of voltage booster cable.



- Rules for Daisy chain and additional voltage booster.
- 24 Volt AC: Maximum 7 NovoCon® S from a voltage (booster) point to an actuator.
- 24 Volt DC: Maximum 12 NovoCon® S from a voltage (booster) point to an actuator.

Using this distribution of voltage boosters will assure enough power supply voltage to all NovoCon® S on network and limit max current to permissible level. You can use volt meter and/or NovoCon voltage alarm in order to verify power supply voltage.

Recommended maximum quantities of NovoCon® S Hybrid/Digital or other BACnet devices in one daisy chain connection are 64 pcs.

General requirements:

- Use Danfoss daisy chain cable to connect two NovoCon® S.
- Use Danfoss digital cable to connect NovoCon® S and another BACnet device.
- Current in cables should not exceed 3Arms at 30°C.
- Use termination resistor (DIP switch 8) on the end of daisy chain.
- Use Danfoss analog cable as voltage booster to increase voltage.
- Same power supply if preferred.
- If two power supplies are used they must have same polarity.

Galvanic separation shall be provided for segments crossing buildings and common ground shall be used for all devices on the same network including routers and gateways.

Tender text

NovoCon™ S Digital/Hybrid actuator

NovoCon™ S is a gear actuator for pressure independent balancing and control valve type AB-QM DN10-32.

- Supply Voltage: 24V AC/DC ±25% 50-60Hz
- Control signal - hybrid version: BACnet, 0-10V/2-10V sequential (0-5V/5-10V), 0-20mA/4-20mA
- Control signal - digital version: BACnet

Actuator has the following remote features:

- AB-QM design flow pre-setting
- Flushing the valve and terminal unit
- Error during closing intrinsic alarm reporting
- LOG/LIN/α-setting characteristics setting
- Speed selection 3/6/12/24 s/mm
- Opening/closing time selection from 18s to 700s
- Auto MAC addressing
- Auto Baud rate detection
- Flow indication based on measured stroke in l/h

- Spindle position accuracy: ±0.05mm
- Cables: Halogen free plug-in available in 1.5m, 5m and 10m length.
- IP Class: 54
- Closing force: 90N
- Stroke: 7mm
- BACnet Testing Laboratories (BTL) listed BACnet MS/TP fieldbus device

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