



Handbook

OPTIMA-R-FC

VAV Controller

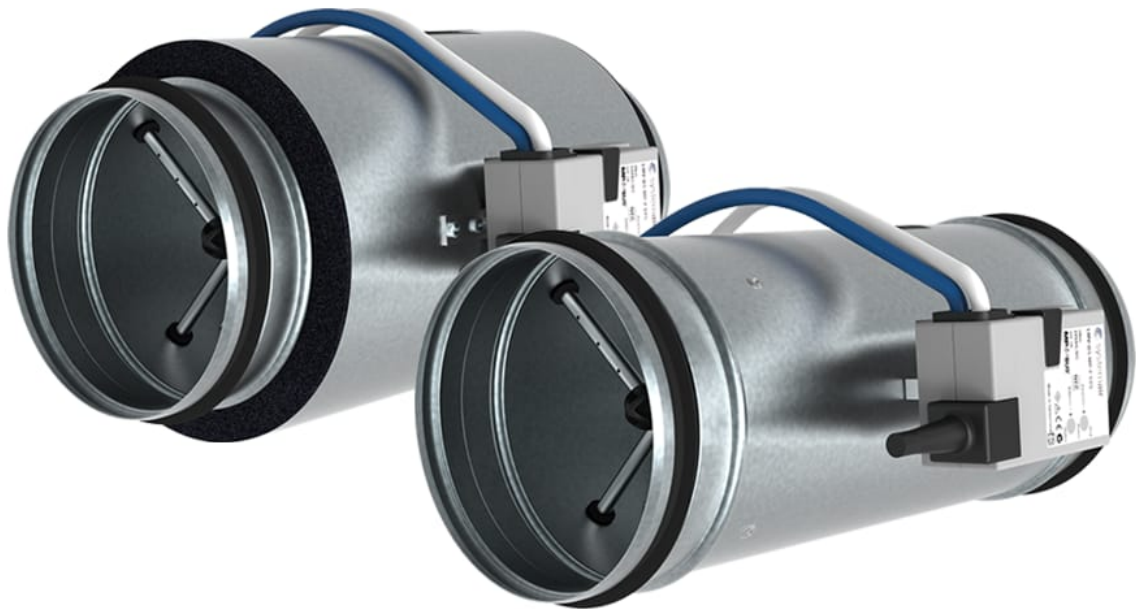


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Description

OPTIMA-R-FC is a variable air volume (VAV) controller with or without insulation. The product is intended to control the air pressure in a ventilation system. The product is installed into circular ducts. Field of application is e.g. offices, hotel rooms, meeting rooms or larger public or industrial halls where the required cooling and heating load will vary on demand.

Highlights

- Damper tightness class 4 according to EN 1751
- Casing tightness class C according to EN 1751
- Conform with hygienic requirements according to VDI 6022
- High measurement/control accuracy in 5% deviation range
- Air volume range of 36 m³/h to 12344 m³/h
- Operating range of duct pressure up to 1000 Pa
- OPTIMA-RI-FC version with external insulation for radiated sound reduction

Types of Product

- **OPTIMA-R-FC**: Circular VAV Controller
- **OPTIMA-RI-FC**: Circular VAV Controller with Acoustic Insulation

List of Accessories

- **ZTH-EU** Configuration and setup tool for VAV controllers OPTIMA-...B...
- **Belimo Assistant** Configuration and setup NFC app. for Android smartphones for OPTIMA-...BP
- **ZIP BT NFC** Converter Bluetooth/NFC smartphones to configure OPTIMA-...BP in Belimo Assistant app.

Design

OPTIMA-R-FC consists of a casing, a damper blade and a measurement probe. The casing is manufactured from galvanized sheet steel. The casing contains a duct connection with a rubber gasket. The damper blade is manufactured from extruded aluminium. The blade is equipped with a rubber gasket. The gasket eliminates leakage in the closed position. The aluminium measurement probe is connected to the VAV controller with flexible polyurethane impulse tubing. The special design of the multi-point averaging cross-flow sensor assures accurate air flow readings. OPTIMA-RI-FC has 19 mm thick polymer foam insulation around the casing. The insulation is covered by a galvanized steel protection sheet.

Controller Type	Flow Volume Adjustment Analog Input	Flow Volume Adjustment via BUS Com.	Controller Parameters Setup	Hard Wired Override	Feedback signal type	Feedback Values (Analog Output) ^1)^	BUS Communicated Variables	Power Supply
BP	DC 0 V (2 V) ... 10 V	MP-BUS	ZTH-EU, PC tool, NFC (Android), MP-BUS	Open ²⁾ , Close, V_{min} , V_{max}	DC 0 V (2 V) ... 10 V, MP-BUS	Actual volume, Damper Angle, Actual pressure	Read/Write: Setpoint, V_{min} , V_{max} , Open, Close Read: Actual volume, Damper angle, Actual pressure, Serial number, Fault/Alarm messages	AC 24 V, DC 24 V
BM		MODBUS, BACnet, MP-BUS	ZTH-EU, PC tool, MODBUS, MP-BUS		MODBUS, MP-BUS, DC 2 V ... 10 V			
BK	KNX	ZTH-EU, PC tool, KNX	Open ²⁾ , Close ²⁾ , V_{max} ²⁾	KNX				
BA	DC 0 V (2 V) ... 10 V		ZTH-EU, PC tool	DC 0 V (2 V) ... 10 V				
GM		MODBUS	Dials on controller, MODBUS	MODBUS, DC 0 V (2 V) ... 10 V	Same variables as BM			

NOTES:

1. Only one analog output available. One value type for feedback can be chosen.
2. Only available with AC 24 V power supply

Controls

The VAV controllers are as standard equipped by compact controllers/actuators with analog setpoint and feedback signals in mode DC 2 V ... 10 V or DC 0 V ... 10 V. The compact controllers are equally available with MP-BUS, MODBUS, BACnet and KNX communication capability. On demand as an alternative, Gateway communication units can be provided and can be connected later to building management systems (only possible with MP-BUS communication on board). VAV compact controllers are factory calibrated as standard to the default air volume. Upon request, the VAV controllers can be adjusted to site-required settings prior to dispatch on V_{min} and V_{max} range. The air volumes can also be readjusted on site with the ZTH-EU handheld service tool or, for the type OPTIMA...GM... by dials on the controller. If specific air volumes for V_{min} and V_{max} are required, this must be indicated before the order of the units for adequate calibration in the factory.

- BP: Belimo LMV-D3 compact controller with MP-BUS communication and analog 0 (2) V ... 10 V setpoint and feedback signals. NFC communication port is available for the device configuration by the "Belimo Assistant" smartphone application.
- BA: Belimo LMV-D3 compact controller without BUS communication and with analog 0 (2) V ... 10 V setpoint and feedback signals.
- BM: Belimo LMV-D3 compact controller with selectable Modbus RTU and BACnet MS/TP bus communication, MP-BUS communication and analog 0 (2) V ... 10 V setpoint and feedback signals.
- BK: Belimo LMV-D3 compact controller with KNX bus communication. The controller uses S-Mode (System mode) as the KNX communication mode.
- GM: Compact controller with parametrizing dials and display for immediate adjustment on site, communicative via Modbus-RTU and with analog 0 (2) V ... 10 V setpoint and feedback signals.

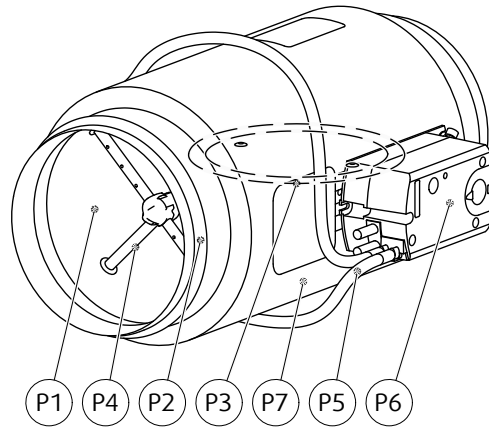
Tightness of the Blade and the Casing

4C in all sizes

The classification is done according to the standard EN 1751 for static pressure up to 1000 Pa.

Product Parts

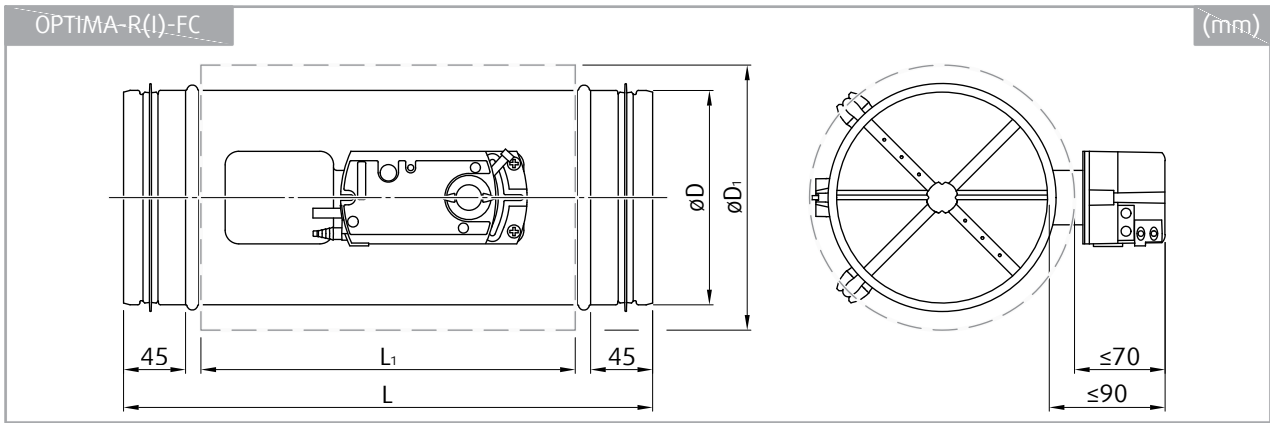
OPTIMA-R(I)-FC



Legend

- P1** Casing
- P2** Duct connection with gasket
- P3** Damper blade
- P4** Air flow measurement probe
- P5** Air flow measurement impulse tubing
- P6** Compact air flow volume controller/damper actuator
- P7** Insulation with outer sheet metal mantle (OPTIMA-RI-FC)

Dimensions & Weights



DN	V _{min} @ 2 m/s *		V _{max} @ 9 m/s *		V _{nom} @ 11 m/s *		øD	L	øD ₁	L ₁	m (R)	m (RI)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s							mm
80	36	10	163	45	199	55	DN-2	290	117	180	1,2	1,6	
100	57	16	254	71	311	86			137		1,4	1,8	
125	88	24	398	111	486	135		DN-2,5	390	162	280	1,6	2,4
140	111	31	499	139	610	169	177			1,8		2,7	
160	145	40	651	181	796	221	197			2,0		3,0	
180	183	51	824	229	1008	280	217			2,2		3,3	
200	226	63	1018	283	1244	346	490		237	380	2,8	4,4	
225	286	79	1288	358	1575	438		262	3,5		5,3		
250	353	98	1590	442	1944	540		287	4,2		6,2		
280	443	123	1995	554	2438	677	DN-3	790	590	480	5,0	7,7	
315	561	156	2525	701	3086	857					317	5,6	8,6
355	713	198	3207	891	3920	1089					352	6,4	9,8
400	905	251	4072	1131	4976	1382					392	8,0	11,7
500	1414	393	6362	1767	7775	2160					437	12,7	19,2
630	2244	623	10100	2806	12344	3429	667	680	17,6	26,8			

Ordering Codes

Non-insulated Variable Air Volume Controller
OPTIMA-R-FC-

Nominal size

DN

Controller type

BP

BA

BM

BK

GM

Signal mode

0 DC 0 V ... 10 V

2 DC 2 V ... 10 V

Insulated Variable Air Volume Controller
OPTIMA-RI-FC-

Nominal size

DN

Controller type

BP

BA

BM

BK

GM

Signal mode

0 DC 0 V ... 10 V

2 DC 2 V ... 10 V

Example of Ordering Code

OPTIMA-R-FC-200-BM-0

Circular VAV controller, 200mm in diameter, with Modbus-RTU and BACnet MS/TP communication on board.

$V_{\min} = 266 \text{ m}^3/\text{h}$ $V_{\max} = 1018 \text{ m}^3/\text{h}$ (default factory adjustment corresponding to min. 2 m/s and max. 9 m/s velocities).

Signal mode DC 0 V ... 10 V.

NOTES: If not stated in the ordering code, the signal mode default mode DC 2 V ... 10 V will be adjusted from the factory. The type BK uses the S-Mode (System mode) as the KNX communication mode.

Accessories

ZTH-EU

Handheld Tool



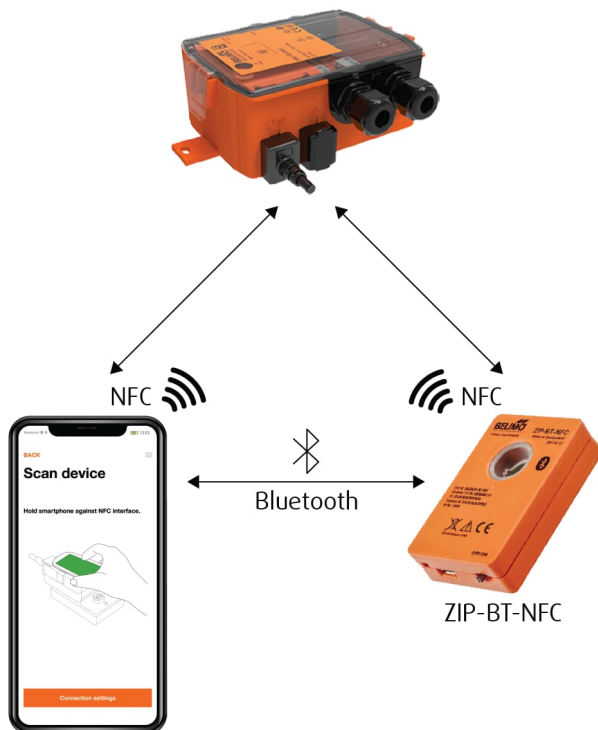
ZTH-EU is a handheld tool for VAV controllers and communicative actuators. The product enables the customer to change the configuration of the VAV controllers.

ZIP-BT-NFC

Communication Port Bluetooth/NFC

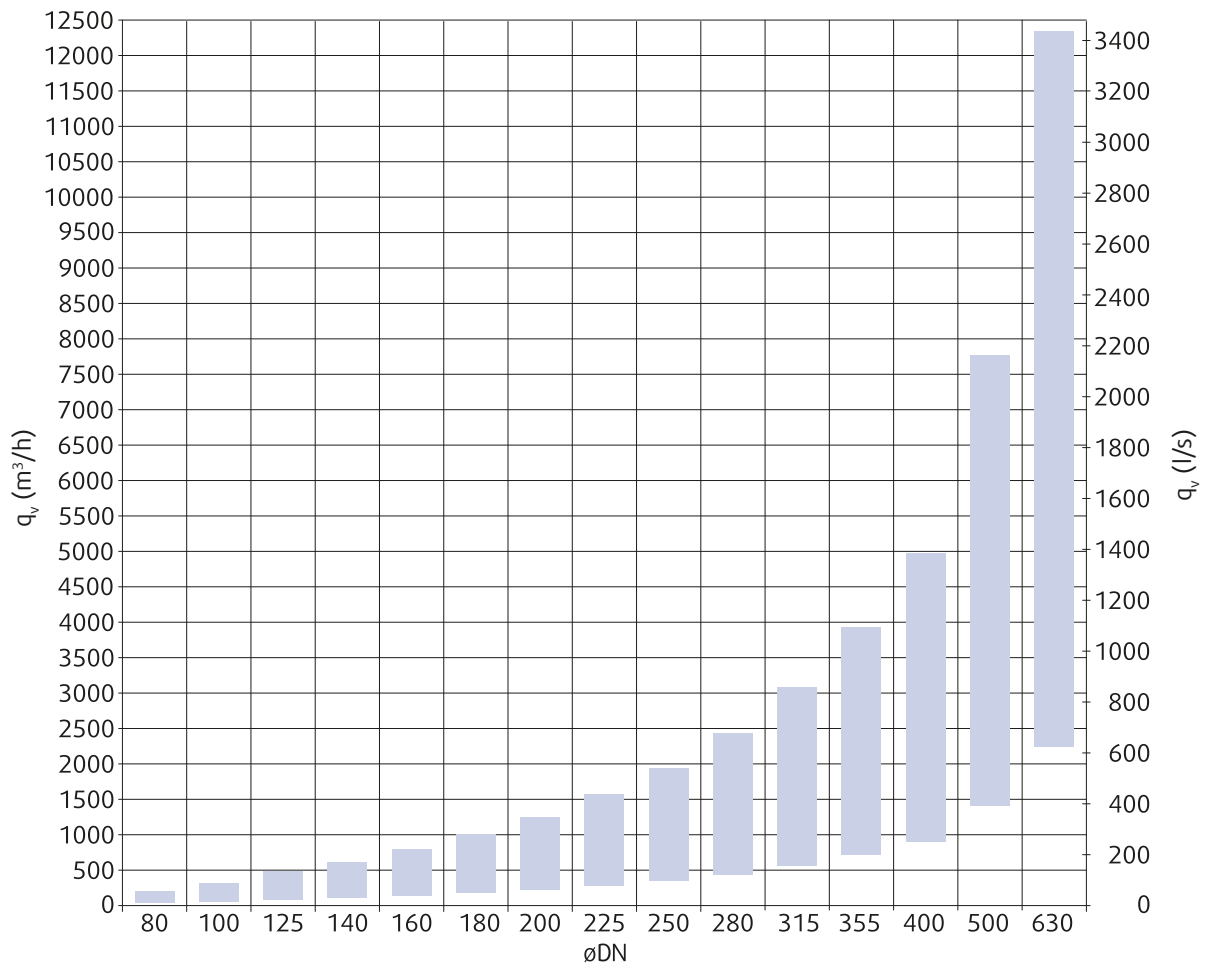


ZIP-BT-NFC is a wireless interface connecting the smartphone with configuration app Belimo Assistant via Bluetooth to the VAV controller VRU... with NFC communication protocol.



Quick Selection

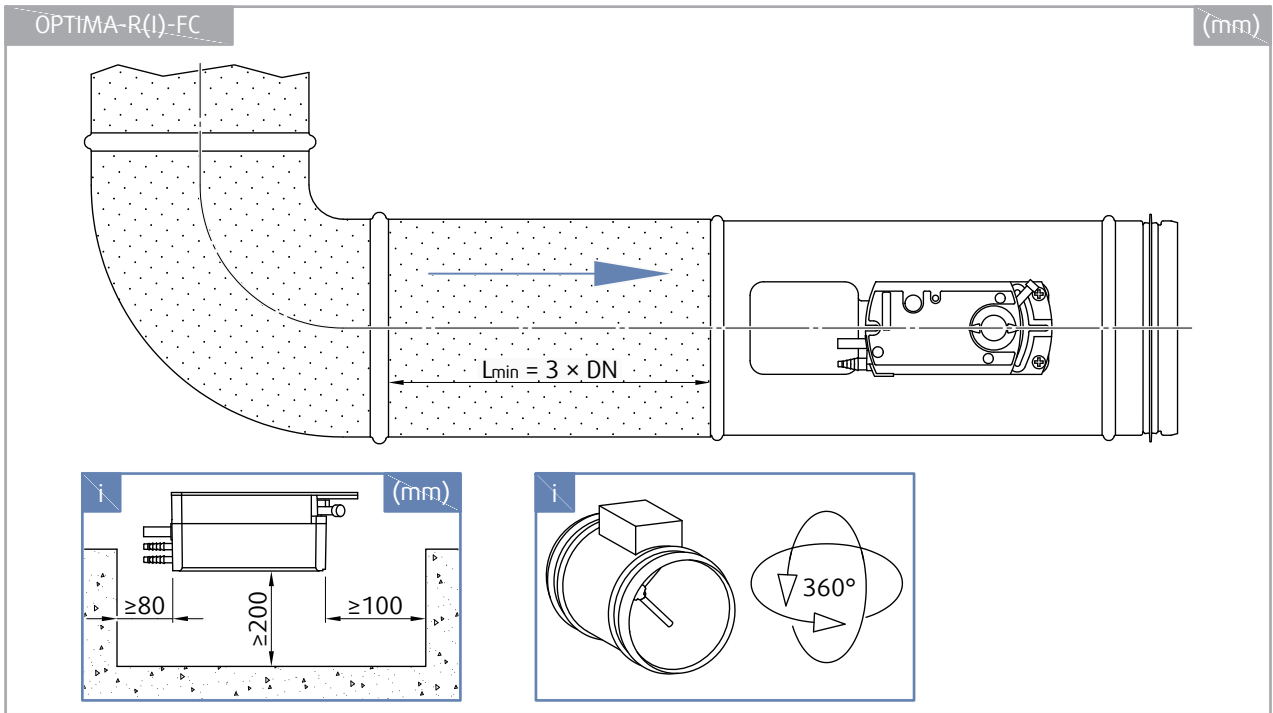
NOTE: The V_{min} can be adjusted between 0% and 100% of V_{nom} . The V_{max} can be adjusted between 20% and 100% of V_{nom}



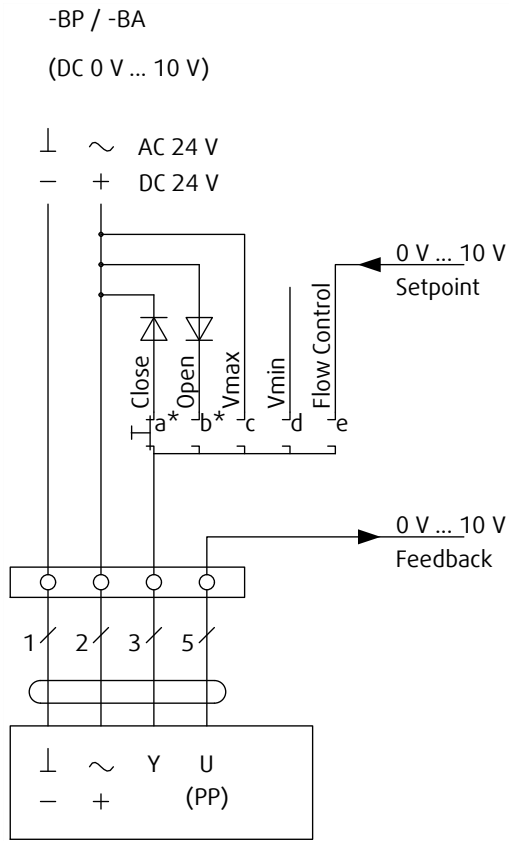
Technical Parameters

Diagrams and technical parameters are available at design.systemair.com (product OPTIMA-R-FC).

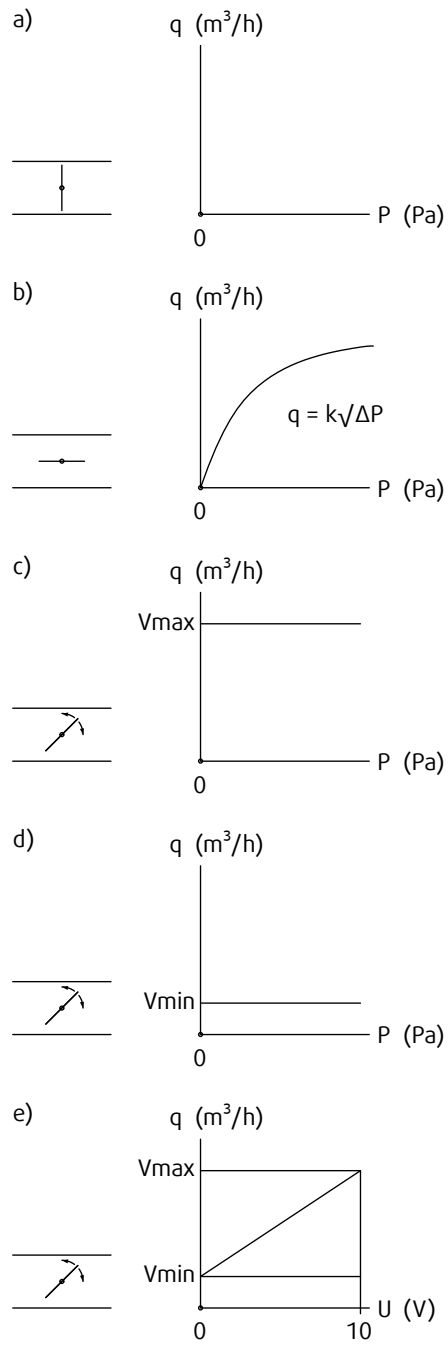
Installation

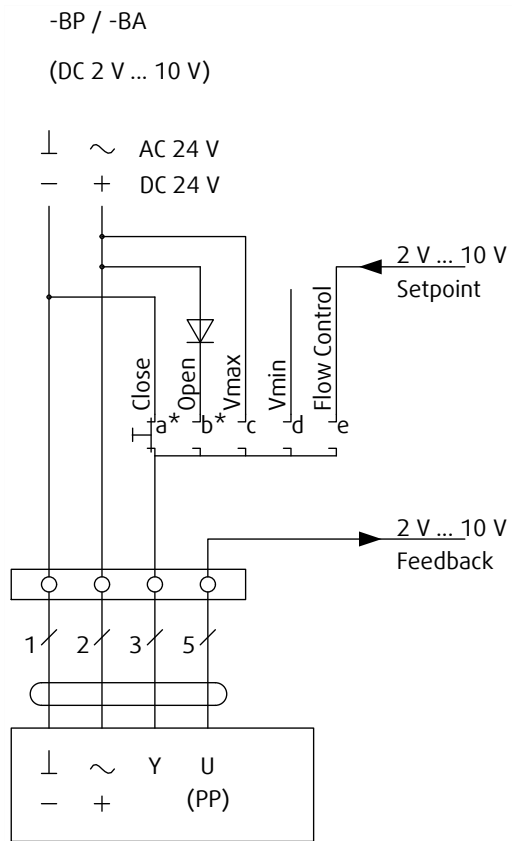


Electrical Connections

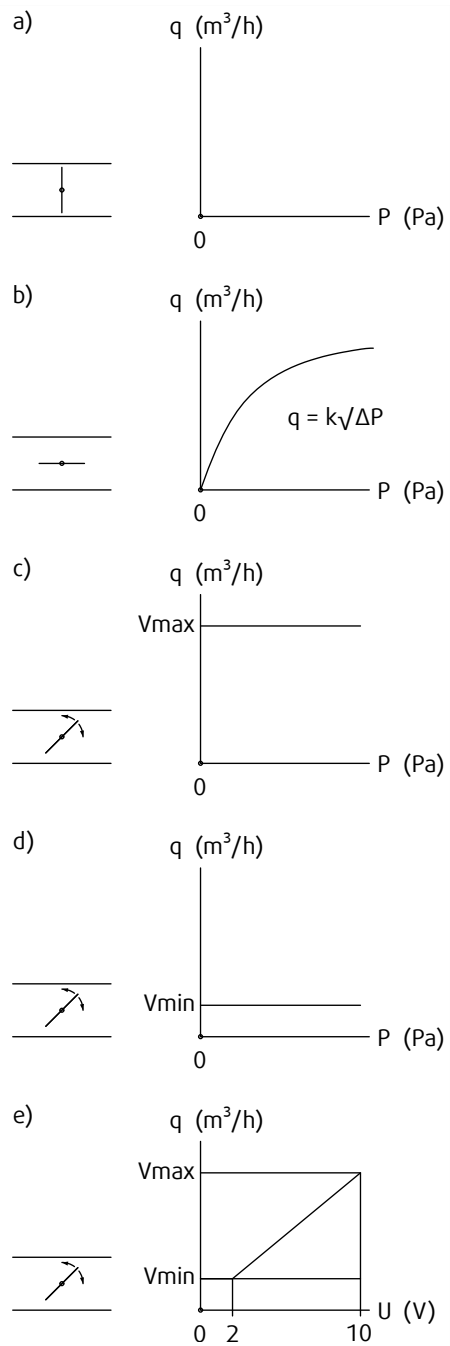


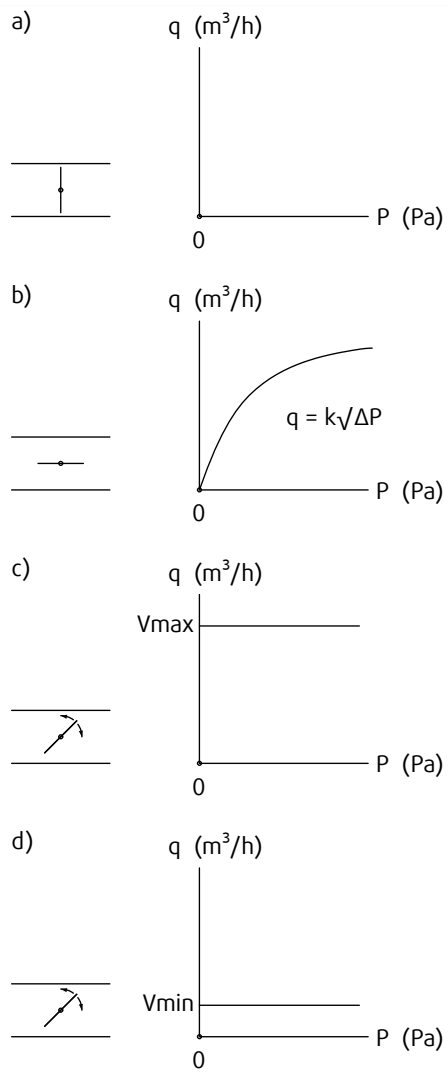
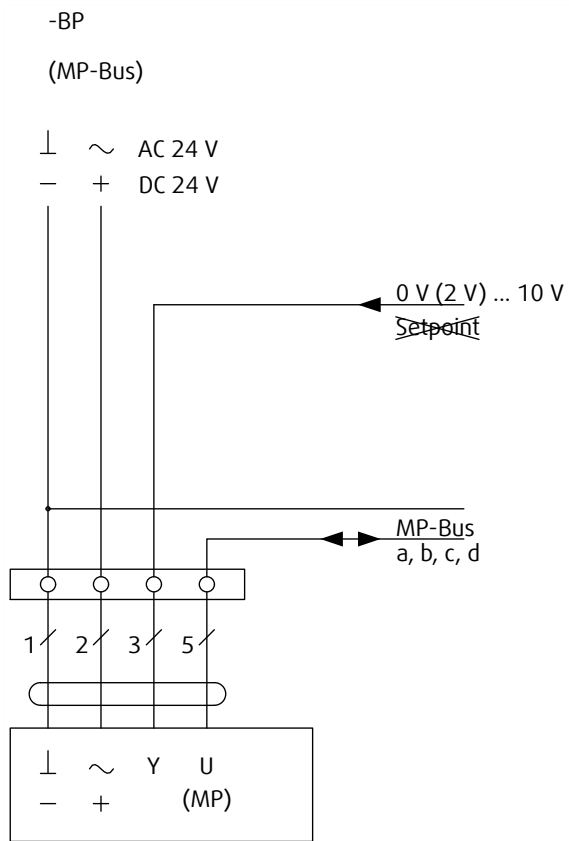
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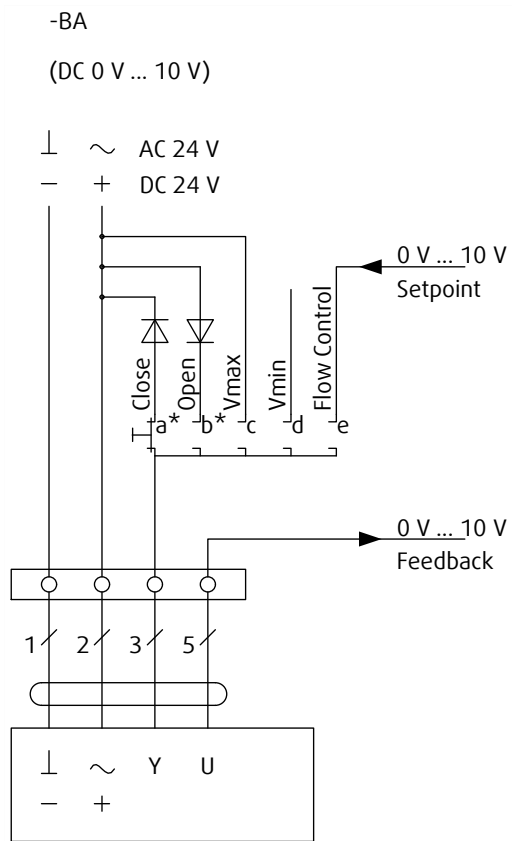




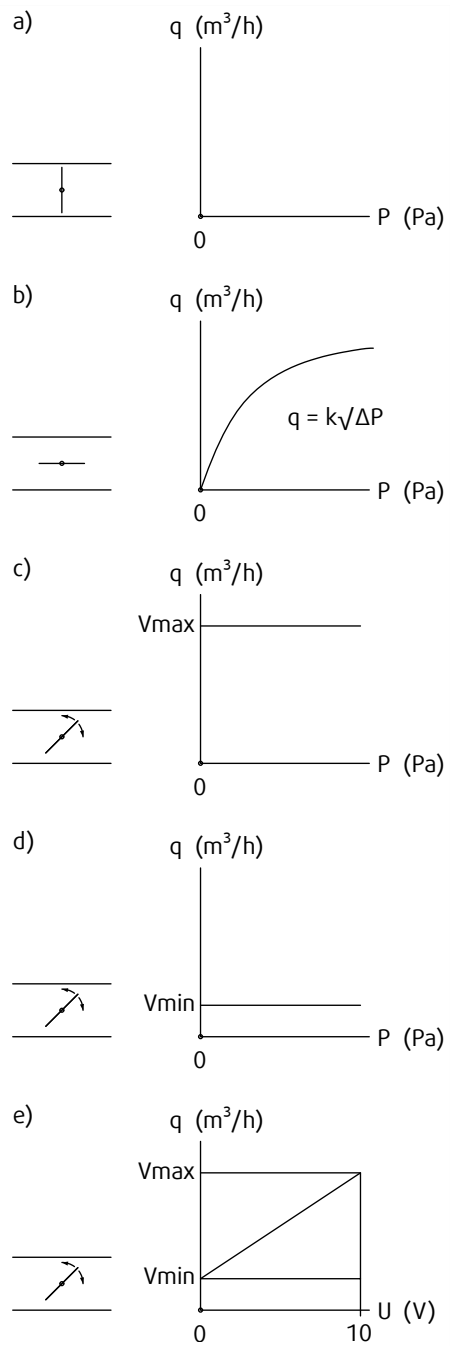
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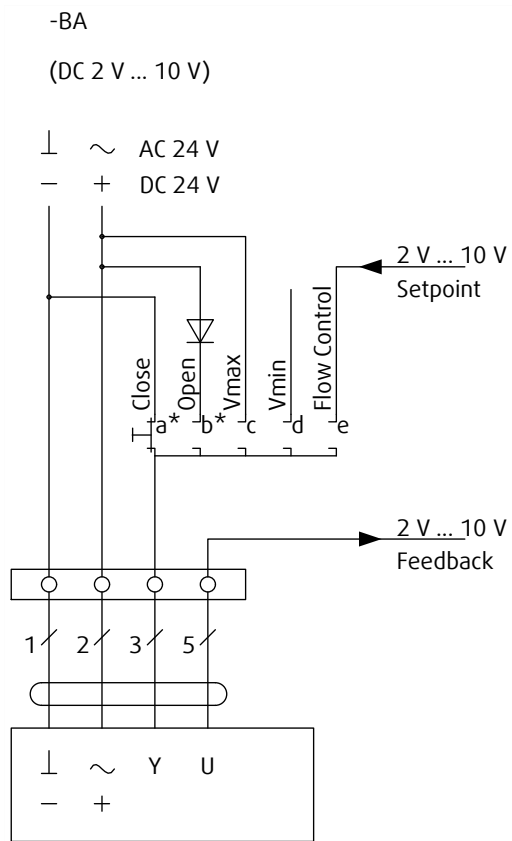




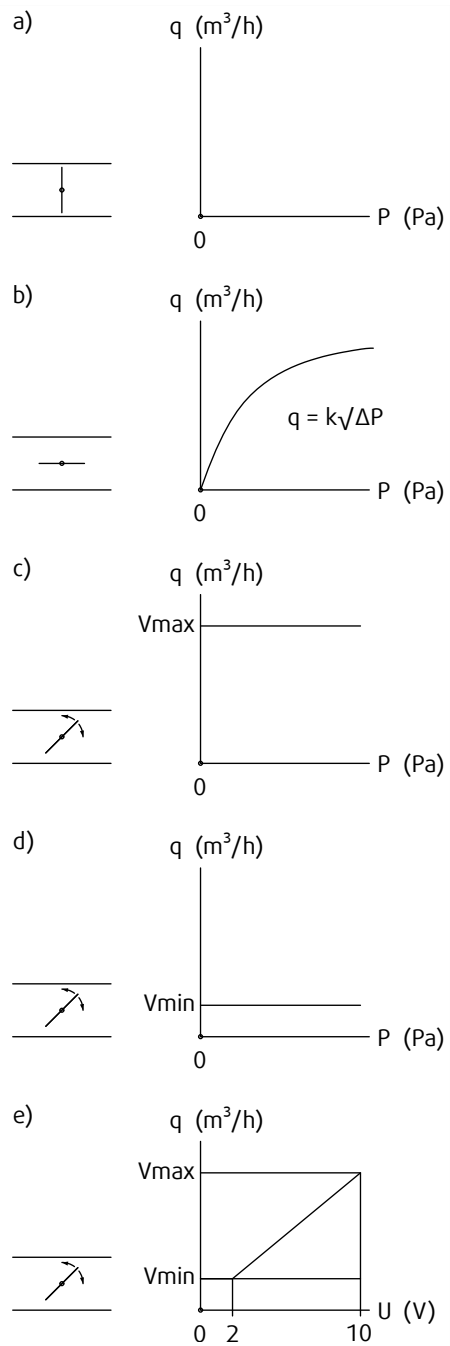


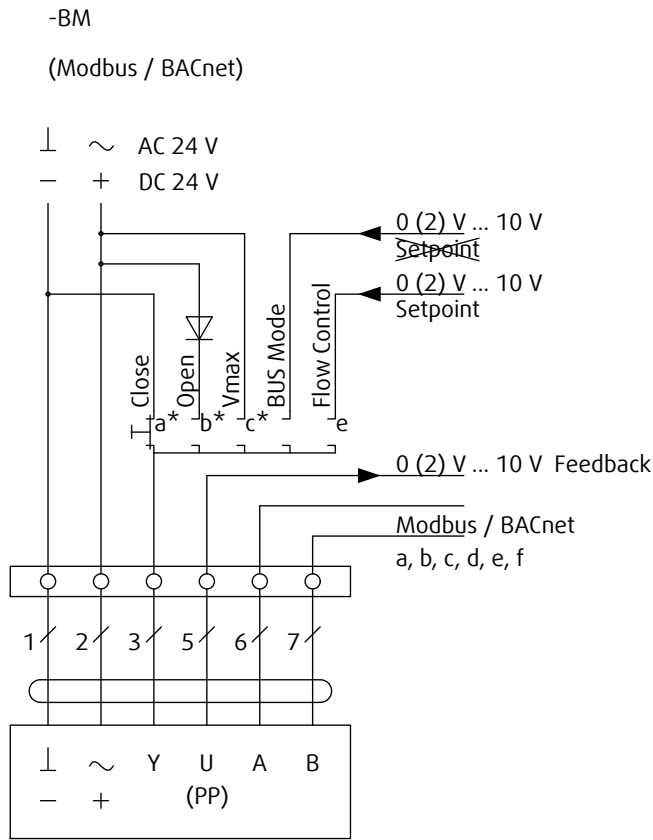
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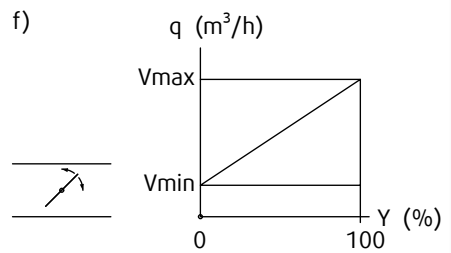
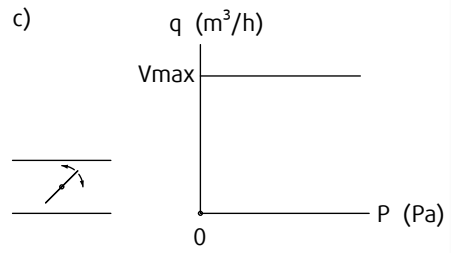
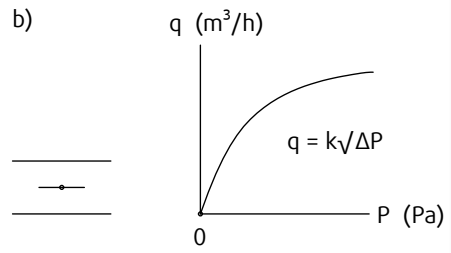
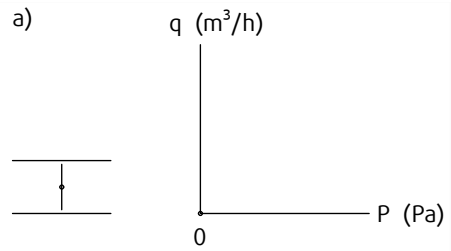
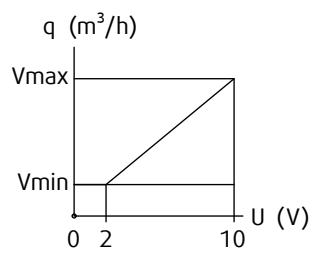
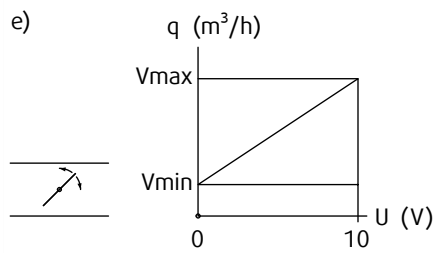
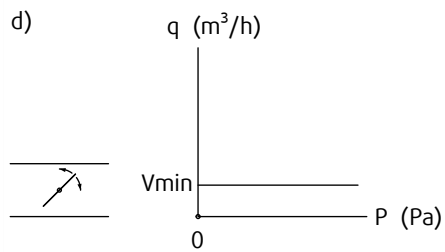


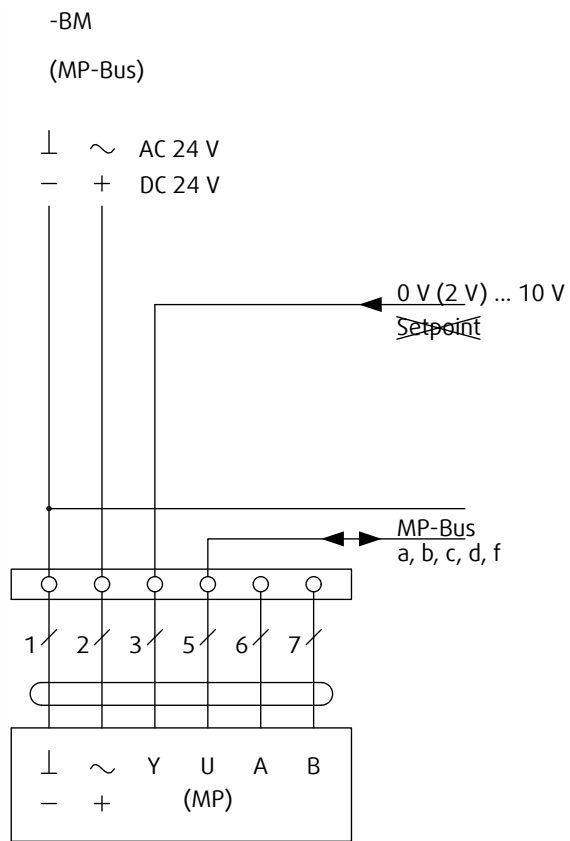
* AC 24 V!



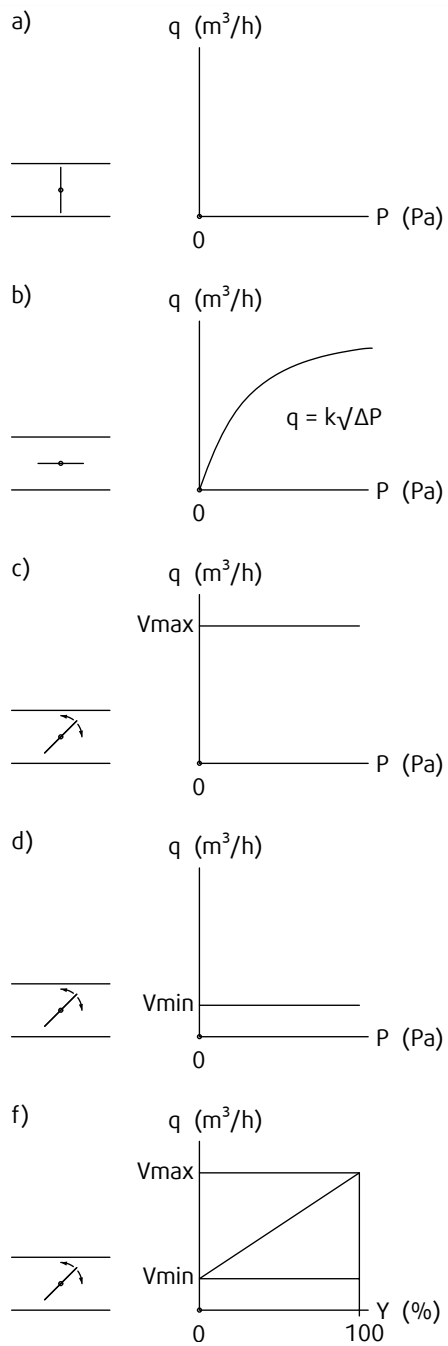


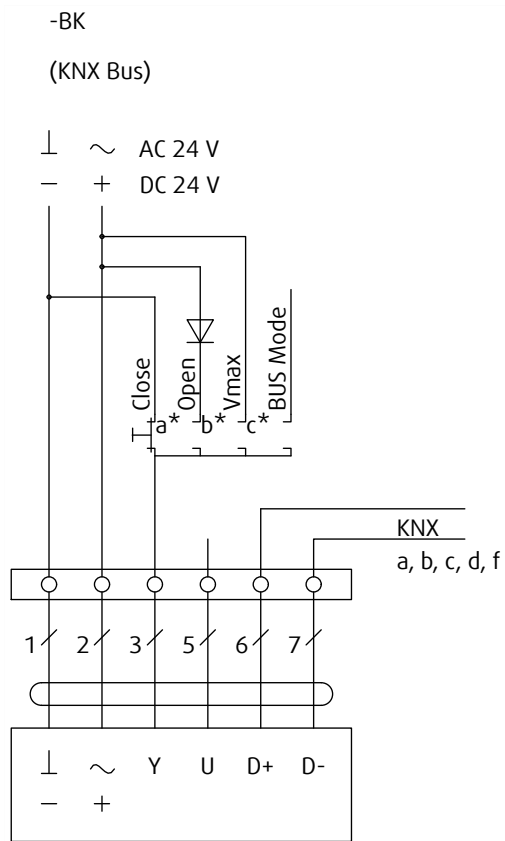
* AC 24 V!



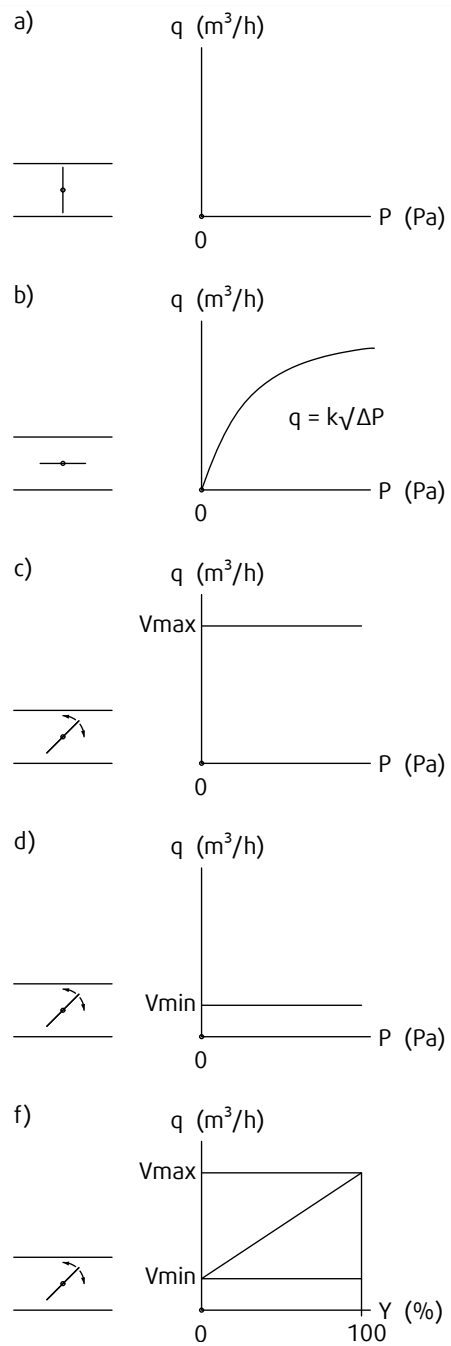


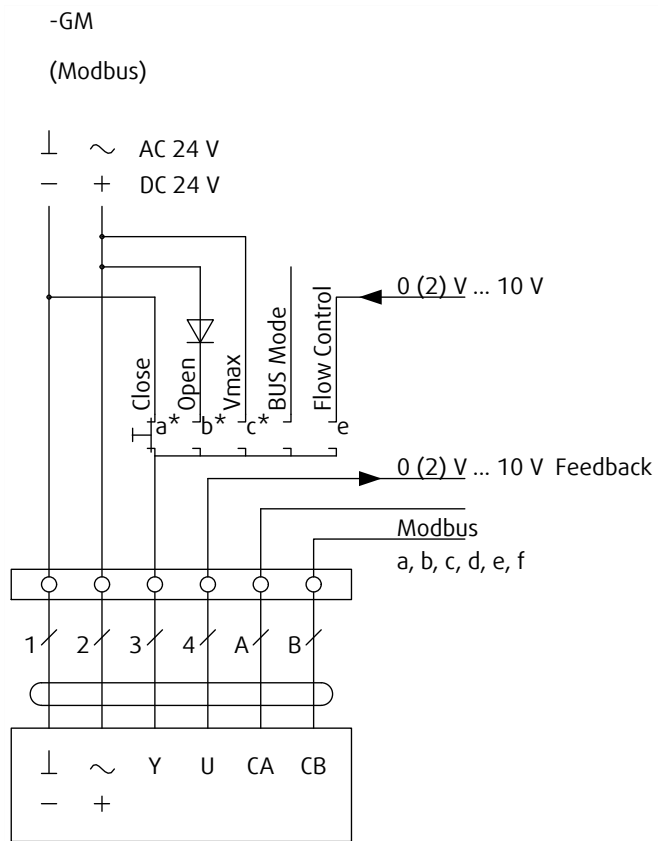
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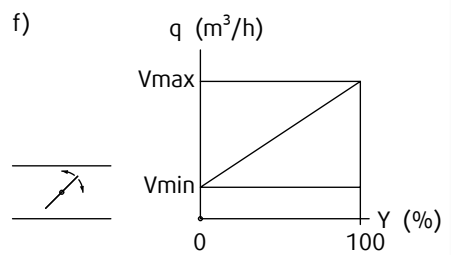
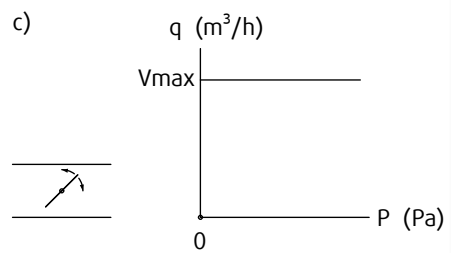
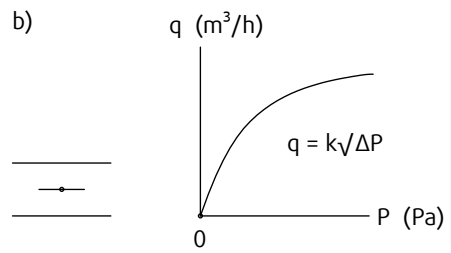
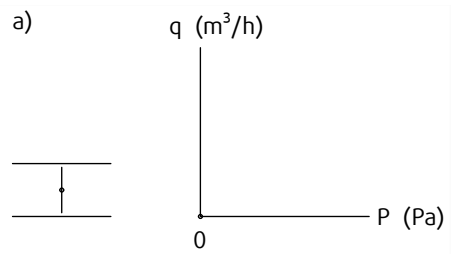
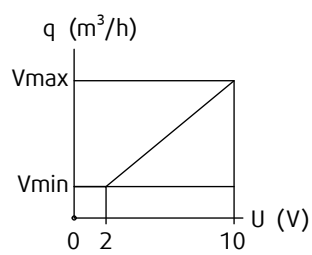
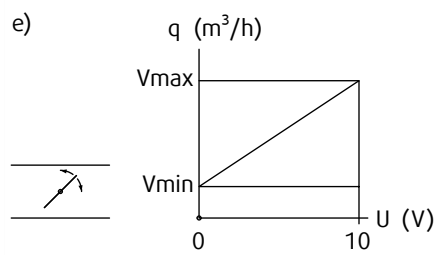
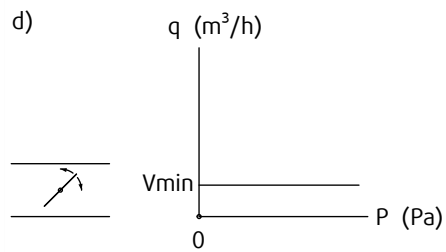


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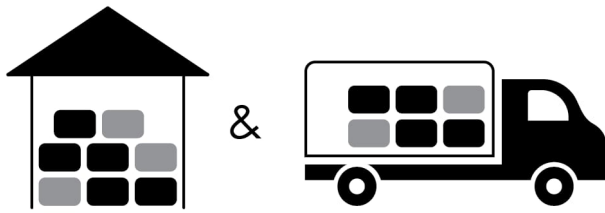






* AC 24 V!




Transport, Storage and Operation




 °C -20 °C ... +50 °C

 % ≤ 95%



 °C -20 °C ... +50 °C

 % ≤ 95%

Supplement

Any deviations from the technical specifications contained herein and the terms should be discussed with the manufacturer. We reserve the right to make any changes to the product without prior notice, provided that these changes do not affect the quality of the product and the required parameters. Current information on all products is available on design.systemair.com.



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