

Type TVJ



FOR NORMAL AND HIGH VOLUME FLOW RATE RANGES

Rectangular VAV terminal units for standard applications regarding the supply air or extract air control in variable air volume systems

- For volume flow rate ranges up to 36,000 m³/h or 10,000 l/s
- Suitable for the control of volume flow rate, room pressure or duct pressure
- Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- High control accuracy
- Suitable for airflow velocities up to 10 m/s
- Casing air leakage to EN 1751, class B

Optional equipment and accessories

- Acoustic cladding for the reduction of case-radiated noise
- Secondary silencer Type TX for the reduction of air-regenerated noise
- Hot water heat exchanger of Type WT for reheating the airflow



APPLICATION

Application

- Rectangular VARYCONTROL VAV terminal units of Type TVJ for the precise supply air or extract air flow control in variable air volume systems
- Closed-loop volume flow control using an external power supply
- For controlling, restricting, or shutting off the airflow in air conditioning systems

Special characteristics

- Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- Factory set-up or programming and aerodynamic function testing
- Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

Nominal sizes

- 39 nominal sizes from 200 × 100 to 1000 × 1000

DESCRIPTION

Variants

- TVJ: VAV terminal unit
- TVJ-D: VAV terminal unit with acoustic cladding
- Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- Acoustic cladding cannot be retrofitted

Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)

Parts and characteristics

- Ready-to-commission unit which consists of mechanical parts and control components.

- Averaging differential pressure sensor for volume flow rate measurement
- Damper blades
- Factory-assembled control components complete with wiring and tubing
- Aerodynamic function testing on a special test rig prior to shipping of each unit
- Set-up data is given on a label or volume flow rate scale affixed to the unit
- High volume flow rate control accuracy

Attachments

- Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- Universal controller: Controller, differential pressure transducer and actuators for special applications
- LABCONTROL: Control components for air management systems

Useful additions

- Secondary silencer Type TX for demanding acoustic requirements
- Heat exchanger Type WT

Construction features

- Rectangular casing
- Flanges on both sides, suitable for duct connection
- Opposed blade action, blades connected by internal gears at both ends
- Position of the damper blade indicated externally at shaft extension
- Bearings with ring seals

Materials and surfaces

Galvanised sheet steel construction

- Casing made of galvanised sheet steel
- Shafts made of galvanised steel
- Damper blades and differential pressure sensor made of aluminium
- Gears made of anti-static plastic (ABS), heat resistant to 50 °C
- Plastic bearings

Powder-coated construction (P1)

- Casing made of galvanised sheet steel, powder-coated

Variant with acoustic cladding (-D)

- Acoustic cladding made of galvanised sheet steel
- Rubber profile for the insulation of structure-borne noise
- Lining is mineral wool

Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

Standards and guidelines

- Casing air leakage to EN 1751, class B

Maintenance

- Maintenance-free as construction and materials are not subject to wear

TECHNICAL INFORMATION

Function, Technical data, Quick sizing, Specification text, Order code, Produktbeziehungen

FUNCTION

Functional description

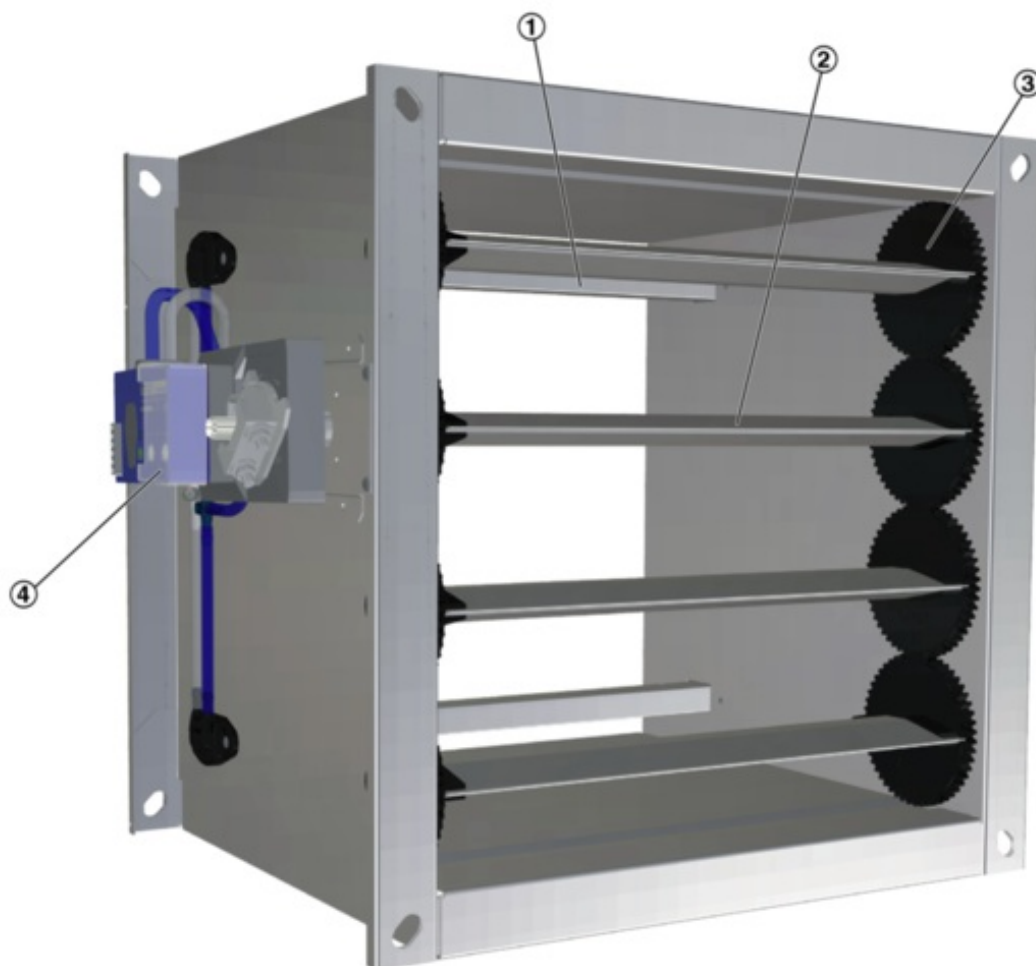
The VAV terminal unit is fitted with a differential pressure sensor for measuring the volume flow rate.

The control components (attachments) include a differential pressure transducer that transforms the differential pressure (effective pressure) into an electric signal, a controller, and an actuator; the control functions can be achieved with an Easy controller, with a Compact controller, or with individual components (Universal or LABCONTROL).

For most applications, the setpoint value comes from a room temperature controller.

The controller compares the actual value with the setpoint value and alters the control signal of the actuator if there is a difference between the two values.

Schematic illustration of the TVJ



① Differential pressure sensor

② Damper blade

③ Gears

④ Control components, e.g. an Easy controller

TECHNICAL DATA

Volumenstrombereiche

Die Mindestdruckdifferenz der VVS-Regelgeräte ist eine wichtige Größe zur Planung des Kanalnetzes und zur Dimensionierung des Ventilators einschließlich der Drehzahlsteuerung.

Es muss sichergestellt sein, dass unter allen Betriebsbedingungen an allen Regelgeräten ein ausreichender Kanaldruck ansteht. Der Messpunkt oder die Messpunkte für die Drehzahlsteuerung des Ventilators sind dementsprechend auszuwählen.

Die Volumenstrombereiche von VVS-Regelgeräten sind von der Nenngröße und von der verwendeten Regelkomponente (Anbauteil) abhängig. Die dargestellten Tabellenwerte sind die Minimal- und Maximalwerte des VVS-Regelgerätes. Für bestimmte Regelkomponenten gelten eingeschränkte Bereiche. Dies gilt insbesondere für Regelkomponenten mit statischem Differenzdrucktransmitter. Volumenstrombereiche für alle Regelkomponenten enthält das Auslegungsprogramm Easy Product Finder.

Nominal sizes	200 × 100 to 1000 × 1000 mm
Volume flow rate range	45 – 10100 l/s or 162 – 36360 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 20 to 100 % of the nominal volume flow rate
Minimum differential pressure	5 – 40 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 – 50 °C

QUICK SIZING

Die Schnellauslegung gibt einen guten Überblick über die zu erwartenden Schalldruckpegel im Raum. Ungefähre Zwischenwerte können interpoliert werden. Zu exakten Zwischenwerten und Spektraldaten führt die Auslegung mit unserem

Auslegungsprogramm Easy Product Finder.

Die Auswahl der Nenngröße erfolgt zunächst nach den gegebenen Volumenströmen V_{\min} und V_{\max} . In der Schnellauslegung sind praxisgerechte Dämpfungswerte berücksichtigt. Liegt der Schalldruckpegel über dem zulässigen Wert, sind ein größeres Volumenstrom-Regelgerät und/oder ein Schalldämpfer erforderlich.

TVJ, Sound pressure level at differential pressure 150 Pa

Nominal size	V		Air-regenerated noise		Case-radiated noise	
			①	②	①	③
Nominal size	V		LPA	LPA1	LPA2	LPA3
	l/s	m ³ /h	dB (A)			
200 x 100	45	162	43	17	31	19
	85	306	47	26	35	24
200 x 100	150	540	49	36	38	29
	215	774	49	41	41	33
300 x 100	65	234	44	18	32	20
	120	432	47	27	35	25
300 x 100	210	756	48	34	38	30
	320	1152	48	40	41	34
400 x 100	85	306	45	20	33	21
	170	612	47	28	37	27
400 x 100	300	1080	47	35	40	32
	425	1530	48	40	43	36
500 x 100	105	378	46	20	34	22
	200	720	47	28	37	27
500 x 100	350	1260	47	34	41	32

	535	1926	48	40	44	37
600 x 100	130	468	46	22	34	22
	260	936	47	28	38	29
600 x 100	450	1620	47	35	42	34
	650	2340	48	39	45	37
200 x 200	85	306	45	20	33	21
	160	576	48	28	36	26
200 x 200	280	1008	48	35	41	32
	415	1494	49	40	43	36
300 x 200	125	450	46	21	34	22
	240	864	47	27	37	27
300 x 200	420	1512	48	34	41	33
	620	2232	48	39	44	37
400 x 200	165	594	46	22	35	23
	330	1188	46	27	38	29
400 x 200	580	2088	47	34	43	35
	825	2970	48	39	46	39
500 x 200	205	738	46	22	36	24
	400	1440	46	27	39	30
500 x 200	700	2520	47	34	44	36
	1035	3726	48	39	47	40

600 x 200	250	900	46	22	36	25
	500	1800	46	27	40	31
600 x 200	870	1800	47	34	45	37
	1250	4500	47	39	47	41
700 x 200	290	1044	46	22	37	25
	560	2016	46	27	40	31
700 x 200	980	3528	47	34	45	38
	1450	5220	47	39	48	42
800 x 200	330	1188	46	22	37	26
	660	2376	46	27	41	32
800 x 200	1160	4176	47	34	46	38
	1650	5940	47	39	49	42
300 x 300	185	666	46	21	35	23
	360	1296	46	26	39	29
300 x 300	630	2268	47	33	43	35
	920	3312	47	39	46	39
400 x 300	245	882	46	21	36	24
	480	1728	46	27	40	30
400 x 300	840	3024	46	33	44	37
	1230	4428	47	39	47	41
500 x 300	305	1098	46	22	67	25

	600	2160	46	27	41	31
500 x 300	1050	3780	47	33	45	38
	1535	5526	47	39	48	42
600 x 300	370	1332	46	22	37	26
	740	2664	46	27	42	32
600 x 300	1290	4644	47	33	46	39
	1850	6660	47	39	49	42
700 x 300	430	1548	46	22	38	27
	840	3024	46	27	42	33
700 x 300	1470	5292	46	33	47	40
	2150	7740	47	39	50	43
800 x 300	490	1764	45	22	38	27
	980	3528	46	27	43	34
800 x 300	1720	6192	46	33	47	40
	2450	8820	47	39	50	44
900 x 300	555	1998	46	22	39	28
	1080	3888	46	27	43	34
900 x 300	1890	6804	46	33	48	41
	2770	9972	47	39	51	44
1000 x 300	620	2232	45	22	39	28
	1240	4464	46	28	44	35

1000 x 300	2150	7740	46	33	48	41
	3100	11160	47	38	51	45
400 x 400	325	1170	45	21	37	26
	640	2304	46	27	41	31
400 x 400	1120	4032	46	34	45	37
	1630	5868	47	40	49	42
500 x 400	410	1476	45	21	38	27
	800	2880	46	27	42	32
500 x 400	1400	5040	46	34	46	38
	2040	7344	47	40	50	43
600 x 400	490	1764	45	21	38	27
	980	3528	46	27	43	33
600 x 400	1720	6192	46	34	47	40
	2450	8820	47	39	50	44
700 x 400	570	2052	45	22	39	28
	1120	4032	46	27	43	34
700 x 400	1960	7056	46	33	48	40
	2850	10260	47	39	51	44
800 x 400	650	2340	45	22	39	28
	1300	4680	45	27	44	35
800 x 400	2280	8208	46	33	48	41

	3250	11700	47	39	51	45
900 x 400	735	2646	45	22	40	29
	1440	5184	46	26	44	35
900 x 400	2520	9072	46	33	49	41
	3670	13212	47	39	52	46
1000 x 400	820	2952	45	22	40	29
	1640	5904	45	27	44	36
1000 x 400	2850	10260	46	33	49	42
	4100	14760	47	38	52	46
500 x 500	510	1836	45	21	38	27
	1000	3600	46	26	43	33
500 x 500	1750	6300	46	33	47	39
	2540	9144	47	39	50	44
600 x 500	610	2196	45	21	39	28
	1200	4320	46	26	43	34
600 x 500	2100	7560	46	33	48	40
	3050	10980	47	39	51	44
700 x 500	710	2556	45	21	39	29
	1400	5040	46	27	44	35
700 x 500	2450	8820	46	33	48	41
	3550	12780	47	39	52	45

800 x 500	810	2916	45	22	40	29
	1600	5760	45	27	44	36
800 x 500	2800	10080	46	33	49	42
	4050	14580	47	39	52	46
900 x 500	915	3294	45	21	40	30
	1800	6480	46	27	45	36
900 x 500	3150	11340	46	33	50	42
	4570	16452	47	39	53	47
1000 x 500	1020	3672	44	22	41	30
	2000	7200	45	27	45	37
1000 x 500	3500	12600	46	33	50	43
	5100	18360	46	38	53	47
600 x 600	730	2628	45	21	40	28
	1440	5184	45	27	44	35
600 x 600	2520	9072	46	33	49	41
	3650	13140	46	39	52	45
800 x 600	970	3492	45	22	41	30
	1920	6912	45	27	45	36
800 x 600	3360	12096	46	33	50	43
	4850	17460	46	39	53	47
1000 x 600	1220	4392	45	22	41	31

	2400	8640	45	27	46	37
1000 x 600	4200	15120	46	33	51	44
	6100	21960	46	38	54	48
800 x 800	1300	4680	44	21	42	31
	2560	9216	45	27	47	38
800 x 800	4480	16128	46	33	51	44
	6500	23400	46	39	55	49
1000 x 800	1620	5832	44	21	42	32
	3200	11520	45	26	47	39
1000 x 800	5600	20160	46	33	52	45
	8100	29160	46	39	55	49
1000 x 1000	2020	7272	44	21	43	33
	4000	14400	45	26	48	40
1000 x 1000	7000	25200	45	33	53	46
	10100	36360	46	39	57	51

① TVJ

② TVJ with secondary silencer TX

③ TVJ-D

SPECIFICATION TEXT

Rectangular VAV terminal units for variable and constant air volume systems, suitable for supply or extract air, available in 39 nominal sizes.

High volume flow rate control accuracy.

Ready-to-commission unit which consists of the mechanical parts and the electronic control components. Each unit contains an averaging differential pressure sensor for volume flow rate measurement and damper blades. Factory assembled control components complete with wiring and tubing.

Differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)

Both ends suitable for the connection of ducts.

Position of the damper blades indicated externally at the shaft extension.

Casing air leakage to EN 1751, class B.

Special characteristics

- Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- Factory set-up or programming and aerodynamic function testing
- Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

Materials and surfaces

Galvanised sheet steel construction

- Casing made of galvanised sheet steel
- Shafts made of galvanised steel
- Damper blades and differential pressure sensor made of aluminium
- Gears made of anti-static plastic (ABS), heat resistant to 50 °C
- Plastic bearings

Powder-coated construction (P1)

- Casing made of galvanised sheet steel, powder-coated

Variant with acoustic cladding (-D)

- Acoustic cladding made of galvanised sheet steel
- Rubber profile for the insulation of structure-borne noise
- Lining is mineral wool

Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)

Technical data

- Nominal sizes: 200 × 100 to 1000 × 1000 mm
- Volume flow rate range: 45 to 10100 l/s or 162 to 36360 m³/h
- Volume flow rate control range (unit with dynamic differential pressure measurement): approx. 20 to 100 % of the nominal volume flow rate
- Minimum differential pressure: 5 – 40 Pa
- Maximum differential pressure: 1000 Pa

Attachments

Variable volume flow control with electronic Easy controller to connect an external control signal; actual value signal can be integrated into the central BMS.

- Supply voltage 24 V AC/DC
- Signal voltages 0 – 10 V DC
- Possible override controls with external switches using volt-free contacts: CLOSED, OPEN, V_{\min} and V_{\max}
- Potentiometers with percentage scales to set the volume flow rates V_{\min} and V_{\max}
- The actual value signal relates to the nominal volume flow rate such that commissioning and subsequent adjustment are simplified
- Volume flow rate control range: approx. 20 – 100 % of the nominal volume flow rate
- Clearly visible external indicator light for signalling the functions: Set, not set, and power failure

Electrical connections with screw terminals. Double terminals for looping the supply voltage, i.e. for the simple connection of voltage transmission to the next controller.

Sizing data

- V _____ [m³/h]
- Δp_{st} _____ [Pa]

Air-regenerated noise

- L_{PA} _____ [dB(A)]

Case-radiated noise

- L_{PA} _____ [dB(A)]

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

ORDER CODE

TVJ – D – P1 / 600×400 / B1B / E 0 / 200 – 900 / NO

1

2

3

4

5

6

7

8

9

TVJ – D / 900×300 / Easy

1

2

4

5

1 Type

TVJ VAV terminal unit

2 Acoustic cladding

No entry: none

D With acoustic cladding

3 Material

No entry: galvanised sheet steel

P1 Powder-coated (RAL 7001), silver grey

4 Nominal size [mm]

B × H

5 Attachments (control component)

Example

Easy Easy controller

BC0 Compact controller

B13 Universal controller

6 Operating mode

E Single

M Master

S Slave

F Constant value

A Differential pressure control – extract air

Z Differential pressure control – supply air

7 Signal voltage range

For the actual and setpoint value signals

0 0 – 10 V DC

2 2 – 10 V DC

8 Volume flow rates [m³/h or l/s], differential pressure [Pa]

V_{\min} – V_{\max} for factory setting

Δp_{\min} for factory setting (operating modes A, Z)

9 Damper blade position

Only with spring return actuators

NO Power off to OPEN

NC Power off to CLOSE

VARIANTS

TVJ

- VAV terminal unit for the control of variable air volume flow rates

TVJ-D

- VAV terminal unit with acoustic cladding for the control of variable air volume flows
- For rooms where the case-radiated noise of the unit is not sufficiently reduced by a false ceiling
- The rectangular ducts for the room under consideration must have adequate acoustic insulation (provided by others) on the fan and room ends
- Acoustic cladding cannot be retrofitted

ATTACHMENTS

TVJ, Regelkomponenten VARYCONTROL

Bestellschlüsseldetail	Regelgröße	Regler	Differenzdrucktransmitter	Stellantrieb
Easyregler				
Easy	Volumenstrom	Easyregler Fabrikat TROX	Dynamisch, integriert	Integriert
Compactregler, dynamisch				
BC0	Volumenstrom	Compactregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Dynamisch, integriert	Integriert
BL0	Volumenstrom	Compactregler mit LonWorks-Schnittstelle Fabrikat TROX/Belimo	Dynamisch, integriert	Integriert
BM0	Volumenstrom	Compactregler mit Schnittstelle Modbus RTU (mit Anschlussleitung) Fabrikat TROX/Belimo	Dynamisch, integriert	Integriert
BM0-J6	Volumenstrom	Compactregler mit Schnittstelle Modbus RTU (mit Anschlussbuchse)	Dynamisch, integriert	Integriert
XB0	Volumenstrom	Compactregler Fabrikat TROX/Gruner	Dynamisch, integriert	Integriert

LN0	Volumenstrom	Compactregler Fabrikat Siemens	Dynamisch, integriert	Integriert
LK0	Volumenstrom	Compactregler mit KNX-Schnittstelle Fabrikat Siemens	Dynamisch, integriert	Integriert
Compactregler, statisch				
SA0	Volumenstrom	Compactregler mit SLC-Schnittstelle Fabrikat Sauter	Statisch, integriert	Integriert
SC0	Volumenstrom	Compactregler mit SLC-Schnittstelle Fabrikat Sauter	Statisch, integriert	Schnelllaufender Stellantrieb, integriert
Universalregler, dynamisch				
B13	Volumenstrom	Universalregler Fabrikat TROX/Belimo	Dynamisch, integriert	Stellantrieb
B1B	Volumenstrom	Universalregler Fabrikat TROX/Belimo	Dynamisch, integriert	Federrücklaufantrieb
XC3	Volumenstrom	Universalregler Fabrikat TROX/Gruner	Dynamisch, integriert	Federrücklaufantrieb
Universalregler, statisch				
BP3	Volumenstrom	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch	Stellantrieb
BPB	Volumenstrom	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch	Federrücklaufantrieb
BPG	Volumenstrom	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch	Schnelllaufender Stellantrieb
BB3	Volumenstrom	Universalregler Fabrikat TROX/Belimo	Statisch	Stellantrieb
BBB	Volumenstrom	Universalregler Fabrikat TROX/Belimo	Statisch	Federrücklaufantrieb
XD1	Volumenstrom	Universalregler Fabrikat TROX/Gruner	Statisch, integriert	Stellantrieb

XD3	Volumenstrom	Universalregler Fabrikat TROX/Gruner	Statisch, integriert	Federrücklaufantrieb
BR3	Differenzdruck	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch, integriert 100 Pa	Stellantrieb
BRB	Differenzdruck	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch, integriert 100 Pa	Federrücklaufantrieb
BS3	Differenzdruck	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch, integriert 600 Pa	Stellantrieb
BSB	Differenzdruck	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch, integriert 600 Pa	Federrücklaufantrieb
BSG	Differenzdruck	Universalregler mit MP-Bus-Schnittstelle Fabrikat TROX/Belimo	Statisch, integriert 600 Pa	Schnelllaufender Stellantrieb
BG3	Differenzdruck	Differenzdruckregler Fabrikat TROX/Belimo	Statisch, integriert 100 Pa	Stellantrieb
BGB	Differenzdruck	Differenzdruckregler Fabrikat TROX/Belimo	Statisch, integriert 100 Pa	Federrücklaufantrieb
BH3	Differenzdruck	Differenzdruckregler Fabrikat TROX/Belimo	Statisch, integriert 600 Pa	Stellantrieb
BHB	Differenzdruck	Differenzdruckregler Fabrikat TROX/Belimo	Statisch, integriert 600 Pa	Federrücklaufantrieb
XE1	Differenzdruck	Differenzdruckregler Fabrikat TROX/Gruner	Statisch, integriert 100 Pa	Stellantrieb
XE3	Differenzdruck	Differenzdruckregler Fabrikat TROX/Gruner	Statisch, integriert 100 Pa	Federrücklaufantrieb
XF1	Differenzdruck	Differenzdruckregler Fabrikat TROX/Gruner	Statisch, integriert 600 Pa	Stellantrieb
XF3	Differenzdruck	Differenzdruckregler Fabrikat TROX/Gruner	Statisch, integriert 600 Pa	Federrücklaufantrieb

BBB	V			Separates Bauteil	Federrücklaufantrieb	②			●	●	●	●	●	●	●
XD1	V			Integriert	Stellantrieb	③		●	●	●	●	●	●	●	●
XD3	V			Integriert	Federrücklaufantrieb	③		●	●	●	●	●	●	●	●
BR1	Δp	MP-Bus		100 Pa	Stellantrieb, Drehmoment für TVT	②				●					
BR3	Δp	MP-Bus		100 Pa	Stellantrieb	②		●	●		●	●	●	●	●
BRB	Δp	MP-Bus		100 Pa	Federrücklaufantrieb	②		●	●	●	●	●	●	●	●
BRG	Δp	MP-Bus		100 Pa	Schnelllaufender Stellantrieb	②		●			●	●	●	●	●
BS1	Δp	MP-Bus		600 Pa	Stellantrieb, Drehmoment für TVT	②				●					
BS3	Δp	MP-Bus		600 Pa	Stellantrieb	②		●	●						●
BSB	Δp	MP-Bus		600 Pa	Federrücklaufantrieb	②		●	●	●					
BSG	Δp	MP-Bus		600 Pa	Schnelllaufender Stellantrieb	②		●	●	●					
BG1	Δp			100 Pa	Stellantrieb, Drehmoment für TVT	②				●					
BG3	Δp			100 Pa	Stellantrieb	②		●	●		●	●	●	●	●
BGB	Δp			100 Pa	Federrücklaufantrieb	②		●	●	●	●	●	●	●	●
BH1	Δp			600 Pa	Stellantrieb, Drehmoment für TVT	②				●					
BH3	Δp			600 Pa	Stellantrieb	②		●	●						
BHB	Δp			600 Pa	Federrücklaufantrieb	②		●	●	●					

XE1	Δp			Integriert, 100 Pa	Stellantrieb	③		●	●	●	●	●	●	●	●
XE3	Δp			Integriert, 100 Pa	Federrücklaufantrieb	③		●	●	●	●	●	●	●	●
XF1	Δp			Integriert, 600 Pa	Stellantrieb	③		●	●	●					
XF3	Δp			Integriert, 600 Pa	Federrücklaufantrieb	③		●	●	●					

① TROX, ② TROX/Belimo, ③ TROX/Gruner, ④ Sauter, ⑤ Siemens

☒ Bestellschlüsseldetail, V Volumenstrom, Δp Differenzdruck

Anbauteile: LABCONTROL Regelkomponenten

☒	Regel- größe	Schnittstelle	V_{min} -/ V_{max} - Verstellung	Differenzdruck- transmitter	Stellantrieb	TVR	TVJ	TVT	TZ- S	TA- S	TVZ	TVA	TVRK	T
	EasyLabregler		Statisch											
Elab	Raumzuluft	TCU3		Integriert	Schnelllaufender Stellantrieb	●	●	●						
	Raumabluft													
	Raumdruck													
	Einzelregler													
	Raumzuluft	TCU3		Integriert	Schnelllaufender Stellantrieb				●		●			
	Raumdruck													
Einzelregler														

TMA	Raumabluft Raumdruck	TCU-LON-II mit LonWorks- Schnittstelle	Integriert	Schnelllaufender Stellantrieb						•	•		
TMB	Schnelllaufender Stellantrieb (bürstenloser Motor)						•		•				
TMA	Raumzuluft Raumabluft Raumdruck Laborabzug	TCU-LON-II mit LonWorks- Schnittstelle	Integriert	Schnelllaufender Stellantrieb								•	•
TMB	Schnelllaufender Stellantrieb (bürstenloser Motor)									•	•		

DIMENSIONS AND WEIGHT

Installation details, Basic information and nomenclature

INSTALLATION DETAILS

Installation and commissioning

- Any installation orientation (except units with static differential pressure transducer)
- With flanges on both ends to make connections to the ducting
- TVJ-D: For constructions with acoustic cladding, ducts on the room side should have cladding up to the acoustic cladding of the controller

Anströmbedingungen

Die Volumenstromgenauigkeit ΔV gilt für gerade Anströmung. Formstücke wie Bögen, Abzweige oder Querschnittsveränderungen verursachen Turbulenzen, die die Messung beeinflussen können. Bei Ausführung von Luftleitungsanschlüssen, wie z. B. dem Abzweig von einer Hauptleitung, ist die EN 1505 zu beachten. Für manche Einbausituationen sind gerade Anströmlängen erforderlich.

Platzbedarf für Inbetriebnahme und Instandhaltung

Um die Arbeiten zur Inbetriebnahme und Instandhaltung zu ermöglichen, ausreichenden Bauraum im Bereich der Anbauteile freihalten. Gegebenenfalls sind Revisionsöffnungen in ausreichender Größe erforderlich, sodass die Anbauteile leicht zugänglich sind.

Platzbedarf

Anbauteile	①	②	③
	mm		
VARYCONTROL			
Easyregler	400	H	300
Compactregler	400	H	300
Universalregler	500	H	300
LABCONTROL			
EASYLAB	500	H	400

H: Gerätehöhe

BASIC INFORMATION AND NOMENCLATURE

Principal dimensions

ØD [mm]

VAV terminal units made of stainless steel: Outside diameter of the spigot

VAV terminal units made of plastic: Inside diameter of the connecting spigot

ØD₁ [mm]

Pitch circle diameter of flanges

ØD₂ [mm]

Outside diameter of flanges

ØD₄ [mm]

Inside diameter of the screw holes of flanges

L [mm]

Length of unit including connecting spigot

L₁ [mm]

Length of casing or acoustic cladding

B [mm]

Duct width

B₁ [mm]

Screw hole pitch of flange (horizontal)

B₂ [mm]

Outside dimension of flange (width)

B₃ [mm]

Width of device

H [mm]

Duct height

H₁ [mm]

Screw hole pitch of flange (vertical)

H₂ [mm]

Outside dimension of flange (height)

H₃ [mm]

Unit height

n []

Number of flange screw holes

T [mm]

Flange thickness

m [kg]

Unit weight including the minimum required attachments (e.g. Compact controller)

Acoustic data**f_m [Hz]**

Octave band centre frequency

L_{PA} [dB(A)]

A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account

L_{PA1} [dB(A)]

A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account

L_{PA2} [dB(A)]

A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account

L_{PA3} [dB(A)]

A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account

All sound pressure levels are based on 20 μ Pa.

Volume flow rates

V_{nom} [m³/h] and [l/s]

Nominal volume flow rate (100 %)

- The value depends on product type and nominal size
- Values are published on the internet and in technical leaflets, and stored in the Easy Product Finder design software.
- Reference value for calculating percentages (e.g. V_{max})
- Upper limit of the setting range and maximum volume flow rate setpoint value for the VAV terminal unit

$V_{min\ unit}$ [m³/h] and [l/s]

Technically possible minimum volume flow rate

- The value depends on product type, nominal size and control component (attachment)
- Values are stored in the Easy Product Finder design software
- Lower limit of the setting range and minimum volume flow rate setpoint value for the VAV terminal unit
- Depending on the controller, setpoint values below $V_{min\ unit}$ (if V_{min} equals zero) may result in unstable control or shut-off

V_{max} [m³/h] and [l/s]

Upper limit of the operating range for the VAV terminal unit that can be set by customers

- V_{max} can only be smaller than or equal to V_{nom}
- In case of analog signalling to volume flow controllers (which are typically used), the set maximum value (V_{max}) is allocated to the setpoint signal maximum (10 V) (see characteristic)

V_{min} [m³/h] and [l/s]

Lower limit of the operating range for the VAV terminal unit that can be set by customers

- V_{min} should be smaller than or equal to V_{max}
- Do not set V_{min} smaller than $V_{min\ unit}$, otherwise the control may become unstable or the damper blade may close
- V_{min} may equal zero
- In case of analog signalling to volume flow controllers (which are typically used), the set minimum value (V_{min}) is allocated to the setpoint signal minimum (0 or 2 V) (see characteristic)

V [m³/h] and [l/s]

Volume flow rate

ΔV [± %]

Volume flow rate tolerance from setpoint value

ΔV_{warm} [± %]

Volume flow rate tolerance for the warm air flow of dual duct terminal units

Differential pressure

Δp_{st} [Pa]

Static differential pressure

$\Delta p_{\text{st min}}$ [Pa]

Static differential pressure, minimum

- The static minimum differential pressure is equal to the pressure loss of the VAV terminal unit when the damper blade is open, caused by flow resistance (sensor tubes, damper mechanism)
- If the pressure on the VAV terminal unit is too low, the setpoint volume flow rate may not be achieved, not even when the damper blade is open
- Important factor in designing the ductwork and in rating the fan including speed control
- Sufficient duct pressure must be ensured for all operating conditions and for all terminal units, and the measurement point or points for speed control must have been selected accordingly to achieve this

Ausführungen

Verzinktes Stahlblech

- Luftführendes Gehäuse aus verzinktem Stahlblech
- Im Luftstrom befindliche Teile, wie bei der Serie beschrieben
- Außenliegende Bauteile, beispielsweise Konsolen und Deckel, in der Regel aus verzinktem Stahlblech

Pulverbeschichtete Oberfläche (P1)

- Luftführendes Gehäuse aus verzinktem Stahlblech, pulverbeschichtet RAL 7001, silbergrau
- Im Luftstrom befindliche Teile pulverbeschichtet oder Kunststoff
- Fertigungsbedingt eventuell einige im Luftstrom liegende Teile aus Edelstahl oder Aluminium pulverbeschichtet
- Außenliegende Bauteile, beispielsweise Konsolen und Deckel, in der Regel aus verzinktem Stahlblech

Edelstahl (A2)

- Luftführendes Gehäuse aus Edelstahl Typ 1.4201
- Im Luftstrom befindliche Teile pulverbeschichtet oder Edelstahl
- Außenliegende Bauteile, beispielsweise Konsolen und Deckel, in der Regel aus verzinktem Stahlblech

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