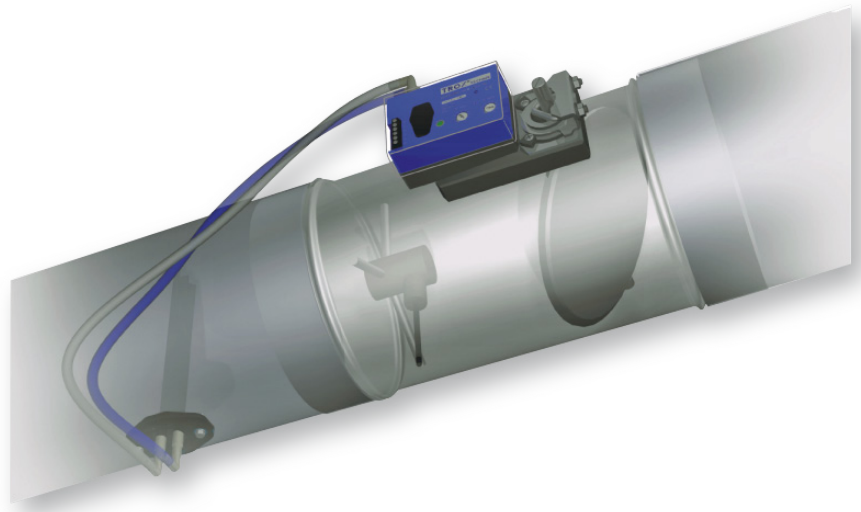


Control components for VAV terminal units

RETROFIT



Rapid replacement without interruption of system operation

Control components for VAV terminal units as a replacement for previous types while the VAV terminal unit remains installed

- Easy alternative to replacing a complete unit
- Replacement in case of modernisation
- Extended range of functions
- Installation without interruption of system operation
- For circular ducts of nominal sizes 100 to 400 mm

Retrofit parts kit consists of:

- Control components Easy, Compact or Universal
- Differential pressure sensor
- Accessories

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RETROFIT	General information	RE – 2
	Function	RE – 3
	Technical data	RE – 4
	Quick selection	RE – 5
	Specification text	RE – 6
	Order code	RE – 7
	Variants	RE – 8
	Accessories	RE – 10

Application

Application

- RETROFIT parts kits for the replacement or modernisation of control components in existing VAV terminal units
- Ideal for cases where it is not possible to replace the entire VAV terminal unit
- Replacement of faulty or dirty electronic or pneumatic units
- Replacement of faulty units with airflow velocity sensors
- Conversion of a constant air to a variable air volume system
- Extension of range of functions to save energy, for more comfort, or for integration with the central BMS

- No changes to ductwork necessary since the existing unit continues to be used

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

Nominal sizes

- For circular ducts with nominal size 100, 112, 125, 140, 160, 180, 200, 225, 250, 280, 315, 355, or 400

Description

Variants

- EasySet
- CompactSet
- UniversalSet

Parts and characteristics

- Kits consist of control components and accessories
- Electronic volume flow controller and actuator
- Differential pressure sensor for volume flow

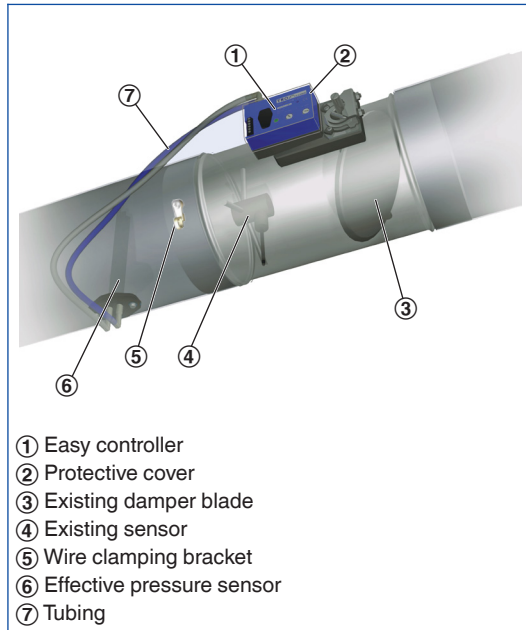
rate measurement

- Stickers for VAV terminal unit and for inspection or maintenance documents

Accessories

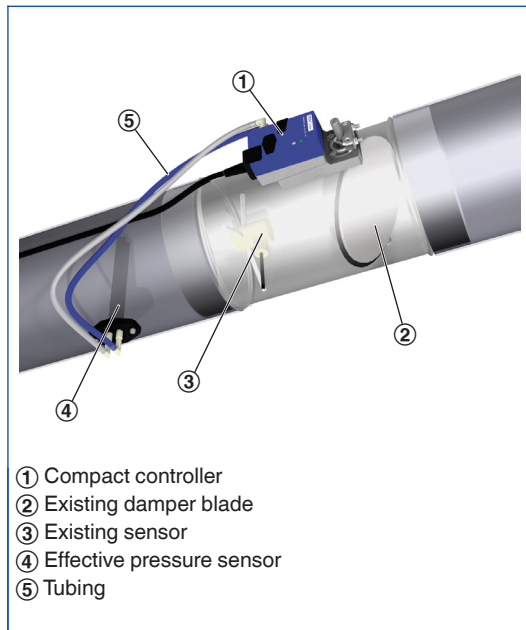
- 1: Special adapter for EasySet and CompactSet
- 2: Special adapter for UniversalSet

EasySet



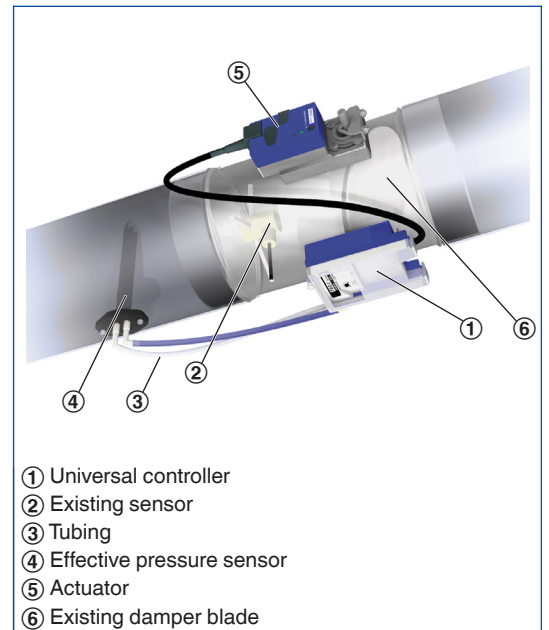
- ① Easy controller
- ② Protective cover
- ③ Existing damper blade
- ④ Existing sensor
- ⑤ Wire clamping bracket
- ⑥ Effective pressure sensor
- ⑦ Tubing

CompactSet



- ① Compact controller
- ② Existing damper blade
- ③ Existing sensor
- ④ Effective pressure sensor
- ⑤ Tubing

UniversalSet



- ① Universal controller
- ② Existing sensor
- ③ Tubing
- ④ Effective pressure sensor
- ⑤ Actuator
- ⑥ Existing damper blade

Easy controllers LMV-D3A and LMV-D3A-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5 VA max.
Power rating (DC)	2.5 W max.
Running time for 90°	110 – 150 s
Setpoint value signal input	0 – 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 – 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU

Compact controllers LMV-D3-MP and LMV-D3-MP-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	4 VA max.
Power rating (DC)	2 W max.
Torque	5 Nm
Running time for 90°	110 – 150 s
Setpoint value signal input	0 – 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 – 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.5 kg

Volume flow controller VRD3

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	without actuator max. 3.5 VA
Power rating (DC)	without actuator max. 2 W
Setpoint value signal input	0 – 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 – 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 40
EC conformity	EMC according to 2014/30/EU
Weight	0.440 kg

Actuators NM24A-V and NM24A-V-ST









Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	3.5 W max.
Torque	10 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.710 kg

Criteria for the selection of the kit

- The selection of the required RETROFIT parts kit depends on the existing control components
- A further criterion is the voltage range of the existing system
- The following overview shows which of the 3 RETROFIT kits are suitable to replace the existing control components and will provide the same range of functions
- CompactSet and UniversalSet are suitable for all existing controllers and may even provide an extended range of functions
- EasySet and CompactSet are suitable for $\varnothing 10 - 20$ mm circular shafts and for 8 – 16 mm square shafts with the shaft end projecting at least 45 mm
- UniversalSet is suitable for $\varnothing 8 - 20$ mm circular shafts and for 8 – 18 mm square shafts with the shaft end projecting at least 25 mm
- Other types of shafts require special adapters

Existing controllers VR1, VR2, VRD and VRD2 are combined with actuators KM24-I, SM24-I, NM24-V or SM24-V.

Selection of parts kit

Existing controller	Existing controller	Signal voltage range	RETROFIT solution
VR1		- 0 – 10 V DC	- EasySet - CompactSet - UniversalSet
VR2		- 2 – 10 V DC	- CompactSet - UniversalSet
VRD		- 2 – 10 V DC	- EasySet (only 0 – 10 V DC) - CompactSet - UniversalSet
VRD2		- 0 – 10 V DC - 2 – 10 V DC	- CompactSet - UniversalSet
NMV24-V		- 0 – 10 V DC	- EasySet - CompactSet - UniversalSet
NMV24-D		- 0 – 10 V DC	- EasySet - CompactSet - UniversalSet
NMV-D2		- 0 – 10 V DC - 2 – 10 V DC	- EasySet (only 0 – 10 V DC) - CompactSet - UniversalSet
NMV-D2M		- 0 – 10 V DC - 2 – 10 V DC	- CompactSet - UniversalSet

Nominal size	\dot{V}_{Nom}		\dot{V}_{min}	
	l/s	m ³ /h	l/s	m ³ /h
100	95	342	10	36
112	125	450	13	47
125	155	558	15	54
140	195	702	20	72
160	250	900	25	90
180	315	1134	32	115
200	405	1458	40	144
225	525	1890	53	191
250	615	2214	62	223
280	795	2862	80	288
315	1030	3708	105	378
355	1275	4590	130	468
400	1675	6030	170	612

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

EasySet

Parts kit for the modernisation of VAV terminal units in systems with circular ducts, for nominal sizes 100 to 400 mm, for supply or extract air. Customers can easily set the volume flow rates on the Easy controller using potentiometers with percentage scales. No supply voltage and no additional devices are required.

A transparent protective cover prevents inadvertent resetting and provides general safety. Clearly visible external indicator light for signalling the functions: Set, not set, no supply voltage. Electrical connections with screw terminals. Double terminal for looping the supply voltage, i.e. for the simple connection of voltage transmission to the next controllers.

Voltage range for control signal and actual value signal 0 to 10 V DC. Possible override controls with external switches using volt-free contacts: CLOSED, OPEN, switching between \dot{V}_{\min} and \dot{V}_{\max} . Same, linear characteristic for all sizes.

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

CompactSet

Parts kit for the modernisation of VAV terminal units in systems with circular ducts, for nominal sizes 100 to 400 mm, for supply or extract air. Customers can easily set the volume flow rates on the Compact controller using the adjustment device or dedicated software.

Voltage range for control and actual value signal 0 – 10 or 2 – 10 V DC. Possible override controls with external switches using volt-free contacts: CLOSED, OPEN, switching between \dot{V}_{\min} and \dot{V}_{\max} . Same, linear characteristic for all sizes.

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

UniversalSet

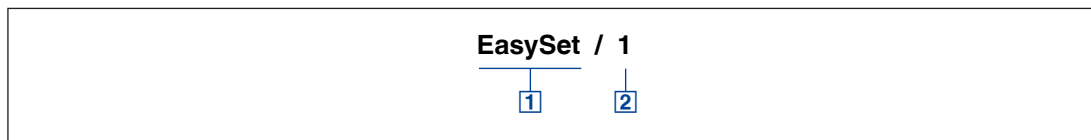
Parts kit for the modernisation of VAV terminal units in systems with circular ducts, for nominal sizes 100 to 400 mm, for supply or extract air. Customers can easily set the volume flow rates on the Universal controller using the adjustment buttons on the controller, an adjustment device, or dedicated software.

Voltage range for control and actual value signal 0 – 10 or 2 – 10 V DC. Possible override controls with external switches using volt-free contacts: CLOSED, OPEN, switching between \dot{V}_{\min} and \dot{V}_{\max} . Same, linear characteristic for all sizes. Separate actuator.

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

RETROFIT



1 Parts kit

EasySet

CompactSet

UniversalSet

2 Accessories

No entry: none

Special adapters are available for units with 8 x 8 mm square shafts or with short circular shafts

1 For EasySet and CompactSet

2 For UniversalSet

Easy controller LMV-D3A



Compact controller LMV-D3-MP



Universal controller VRD3



Actuator NM24A-V



Any attachments are to be defined with the order code of the VAV terminal unit.

Application

- RETROFIT parts kit with Easy controller LMV-D3A

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

Parts and characteristics

- Differential pressure sensor for the

measurement of volume flows using the effective pressure principle

- Easy controller combines volume flow controller and actuator in one casing
- Tubes, small parts, operating manual, sticker

Installation and commissioning

- Set the volume flow rate percentages on scaled potentiometers, without additional adjustment device
- Start the functional test by pressing the function button
- Green indicator light shows the operating state

Application

- RETROFIT parts kit with Compact controller LMV-D3-MP

Special features

- Quick replacement
- Low modernisation cost, quick return on investment
- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

Parts and characteristics

- Differential pressure sensor for the measurement of volume flows using the

effective pressure principle

- Compact controller combines volume flow controller and actuator in one casing
- Tubes, small parts, operating manual, sticker

Installation and commissioning

- Set the volume flow rates with an adjustment device or using an interface and dedicated software (to be supplied by others)
- Set the operating mode 0 – 10 V DC or 2 – 10 V DC
- Carry out a functional test using adjustment device, software or voltage measurement

Application

- RETROFIT parts kit with Universal controller VRD3 and actuator NM24A-V

Special features

- Quick replacement
- Low modernisation cost, quick return on investment

- No interruption of system operation
- Low costs of disposal
- Electronic compatibility remains unchanged

Parts and characteristics

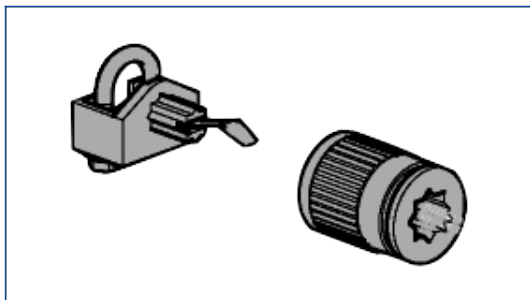
- Differential pressure sensor for the measurement of volume flows using the effective pressure principle
- Universal controller
- Actuator
- Tubes, small parts, operating manual, sticker

Installation and commissioning

- Set the volume flow rate percentages on scaled potentiometers, without additional adjustment device
- Alternatively, set the volume flow rates with an adjustment device or using an interface and dedicated software (to be supplied by others)
- Set the operating mode 0 – 10 V DC or 2 – 10 V DC
- Carry out a functional test using adjustment device, software or voltage measurement

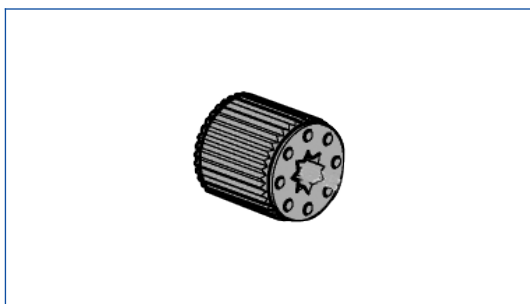
Shaft clamp

Special adapter 1 for EasySet and CompactSet



Existing shaft
- 8 mm x 8 mm square shaft (existing actuator KM 24-I)
- \varnothing 8 to 12 mm circular shaft

Special adapter 2 for UniversalSet



Existing shaft
- 8 mm x 8 mm square shaft (existing actuator KM 24-I)