

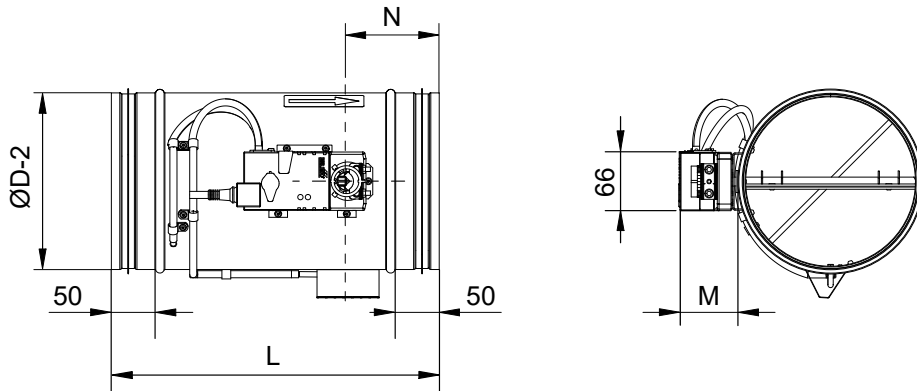


NORDdamper

RPM-LV Installation and maintenance instructions

RPM-LV Installation and maintenance instructions

Technical specifications:



Nominal size ØD [mm]	L [mm]	M [mm]	N [mm]	Ø [mm]	Weight [kg]	
					uninsulated	insulated
100	300	84	110	72	1.7	2.6
125	300	84	110	72	1.9	3.0
160	300	72	110	72	2.3	3.5
200	370	72	150	72	3.1	4.7
250	450	72	190	72	4.2	6.5
315	450	72	190	72	5.2	7.9

Operating conditions and storage

Operating conditions: temperature 0 °C... ..+50 °C and air humidity 5 RH%... ..95 RH%.

The device must be stored indoors in a place free from harmful vapours, gases and dust. The temperature of the storage room should be between -5 °C and +40 °C, the humidity should not exceed 80 RH%.

Design instructions

Start the design process by selecting the right VAV damper size for the current airflow range. Note that the VAV damper size might be even smaller than the current duct size. The VAV damper will not be able to work properly if the airflow is out of the operation range of the damper. The most common design fault usually is not checking the operating range of the VAV damper.

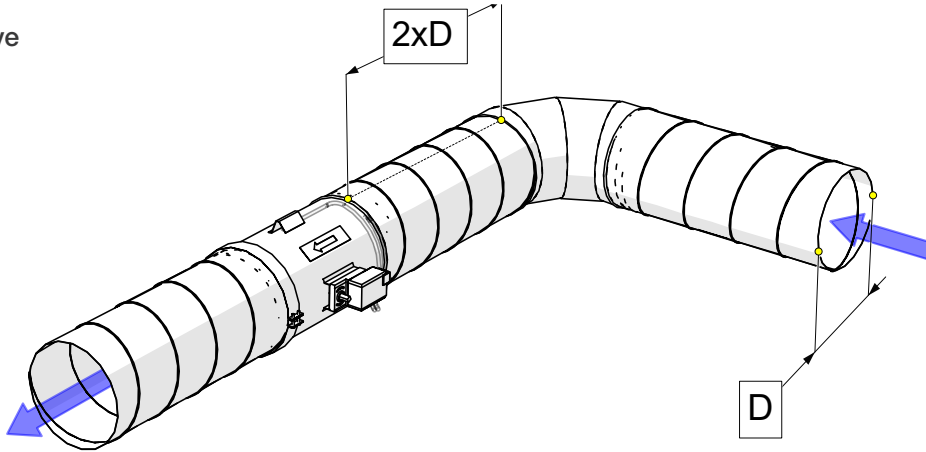
1. Specify the desired range of the airflow. Note that the air handling unit may use several fan speeds. Take all fan speeds into account when checking the airflow range.
2. Find the most suitable size of VAV damper for the desired airflow range. The size might even be smaller than the current duct size.
3. Select an appropriate installation location for the VAV damper. Take into account the safety distance, maintenance space and accessibility to the VAV damper. Use a service hatch, if necessary.

The VAV damper should not be used in greasy, dusty and dirty air handling environments.

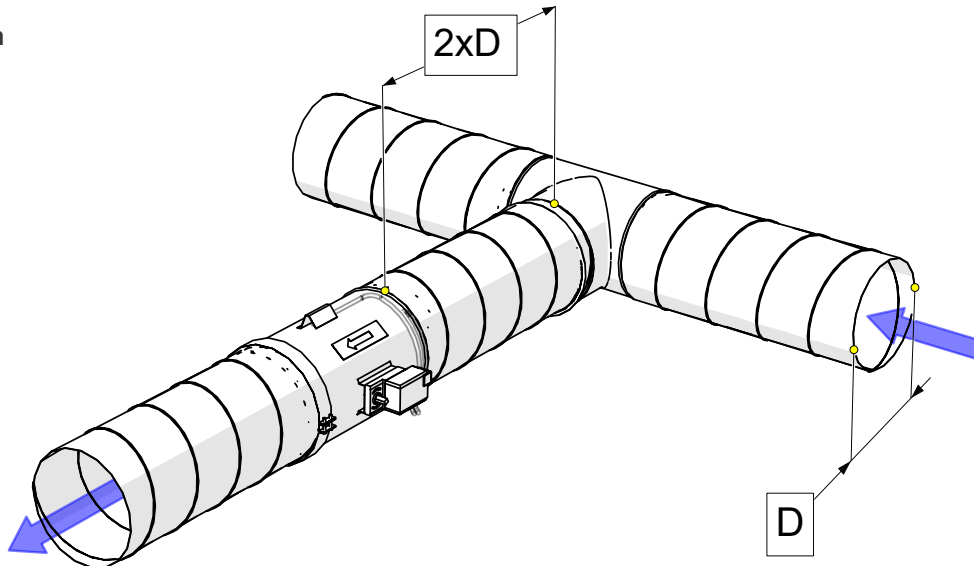
Installation

Install the VAV damper in a place free of airflow disturbances and take into account the safety distance shown below. Airflow direction affects the safety distances. Duct bends, T-branches and silencers will affect the airflow and might make it turbulent. The VAV damper is inaccurate in turbulent airflow. Safety distance instructions must be followed to ensure decent operation of the VAV damper

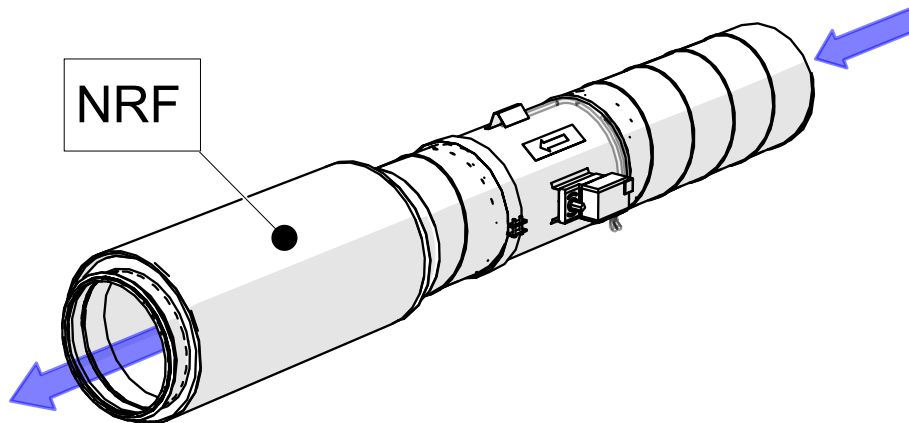
1. 90° curve



2. T-branch

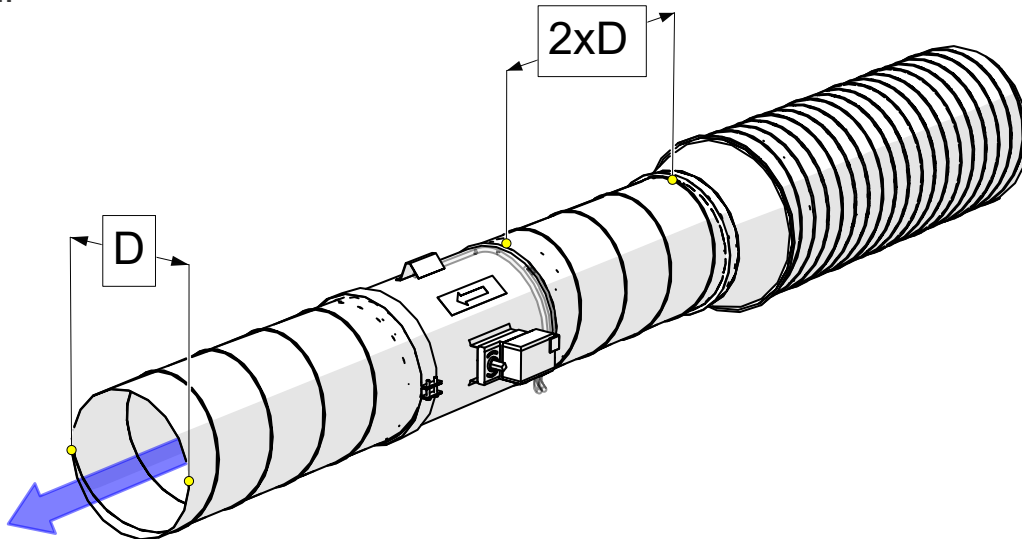


3. Silencer

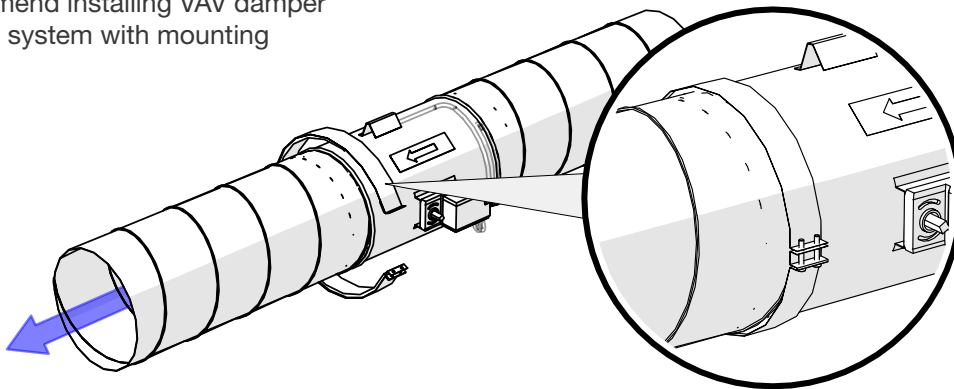


When using ETS NORD NRF or NTP silencer, the safety distance is 0 x ØD. Silencer with baffle or separate absorption element requires a safety distance of 2 x ØD.

Reduction

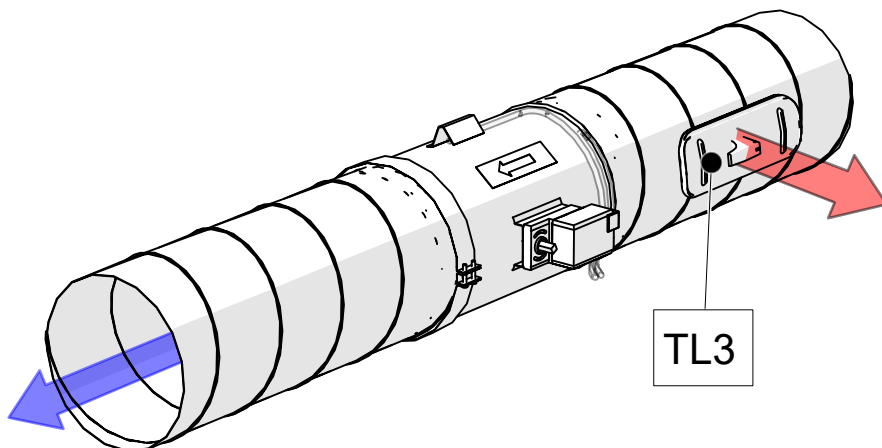


We recommend installing VAV damper to the duct system with mounting clamps.



Maintenance instructions

The VAV damper is exceptionally long lasting. The VAV damper must be cleaned regularly, taking into account the surrounding environment and its working conditions. In a dusty environment, cleaning must take place even more regularly. Regular cleaning of the VAV damper will ensure proper function and a long lifetime of the device.

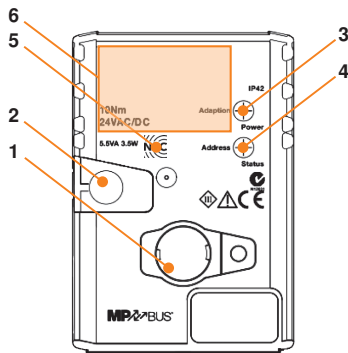


Technical information and instructions for the actuator

Table 6.1.1 Technical Data

Belimo actuator LMV-D3W-MP.1 MDK		
Supply	Nominal voltage	24 V AC 50/60 Hz
	Operating range	AC 19.2... 28.8 V DC 21.6... 28.8 V
	Dimensions	4 VA (paid) 8 A @ 5 ms)
	Input - operation	2 W
	Input - standby mode	1 W
VAV mode for reference value input Y	Desired airflow ("damper closed" command)	DC 2 ... 10 V or DC 0... 10 V (Ri ≥ 100 kΩ)
	Step-by-step adjustments	24 V from an AC input
Mode for actual value signal U5	Actual airflow / Damper position	DC 2 ... 10 V or DC 0... 10 V (max 0.5 mA)
Electrical connection		1 m cable 4 x 0.75 mm2
Protection class		III (safe extra-low voltage)

Operating and display elements:



1. Tool connection with cover
2. Gear disengagement
3. Button 1 «Adaption» LED 1 «Power»
4. Button 2 «Address» LED 2 «Status»
5. NFC logo
6. NFC antenna range

Tool connection (1)

Enables the direct connection of a Belimo operating device, e.g.: PC-Tool, ZTH-GEN service tool for adjusting or checking the VAV-Compact. This connection is also available with an active MP integration.

Gear disengagement (2)

At the time of commissioning, the damper blade can be adjusted by hand with the aid of the push-button (2) on the VAV-Compact. Manual overrides are possible at any time – even under voltage – without limiting the functioning of the device. In order to avoid deviations in control mode, a synchronisation is carried out after each manual override – with visual display (4, Status LED).

Power and operating display (3)

The status of the 24V voltage supply and the operational readiness of the VAV-Compact is displayed by the green LED (Power).

Synchronisation (2) – with visual display (4)

In order to prevent permanent deviations caused by an actuation of the gear disengagement (2), a synchronisation of the position calculation is carried out. This ensures a correct position modulation of the damper blade. The progress of the function can be seen on the Status LED (4).

Deviations caused by a manual override are excluded as a result.

This synchronisation acts at the same time as a simple functional check.

The synchronisation behaviour can be adjusted in accordance with the utilisation.

Angle of rotation adaption (3) – with visual display (4)

This function detects the upper and lower spindle end stops and stores them in the VAV-Compact. The running time and the working range are adapted to the available angle of rotation. Detection of the mechanical end stops enables a gentle approach to the end position and protects the actuator and damper mechanisms. The progress of the function can be seen on the Status LED (4).

The adaption behaviour can be adjusted in accordance with the utilisation.

Bus function – Addressing (4)

During the addressing, the VAV-Compact is assigned an MP-Bus address (MP1 ... 8) and the device is switched in bus function.

For the process, see the section: MP-Bus integration.

Display of active MP-PP communication (4)

During the addressing, the VAV-Compact is assigned an MP-Bus address (MP1 ... 8) and the device is switched in bus function.

NFC logo (5) and NFC antenna range (6)

Devices with NFC logo (5) have the antenna in the area marked (6).

Devices marked with the NFC logo can be used via NFC connection with Assistant App (.. MV-D3-MP since 2015).

Prerequisites:

- A NFC compatible Android smartphone
- Belimo Assistant (Google Play Store)

The NFC antenna range of the VAV-Compact is located between Belimo or the OEM logo and the NFC mark.

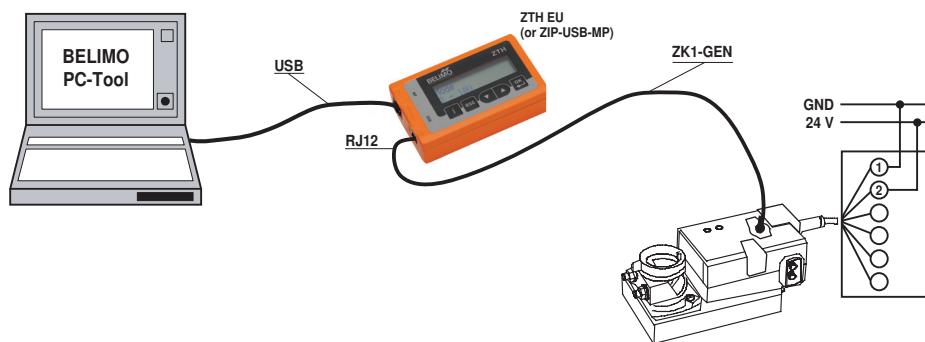
Align NFC-capable Android Smartphone, with Assistant App loaded, in such a way on the VAVCompact that the two NFC antennas are above one another.



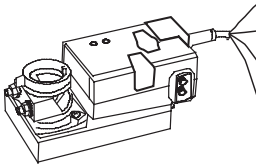
ZTH/PC-Tool On-board service connection

The service connection integrated in the VAV-Compact enables rapid connection of the operating devices ZTH.. and PC-Tool.

For the PC-Tool connection, the PC is connected per USB cable with the level converter ZTH EU or ZIP-USB-MP.



Connecting cable:

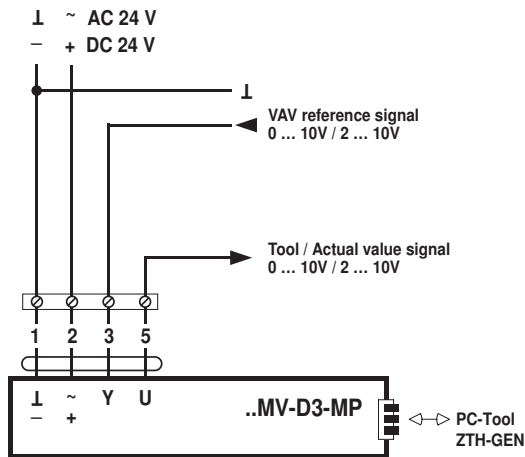


No.	Designation	Wire Color	Function
1.	— 1	black	AC/DC 24V supply
2.	— + ~	red	
3.	← Y	white	Input for – Sensor interface – Override control
4.	→ U	orange	MP-Bus connection

Wiring diagrams

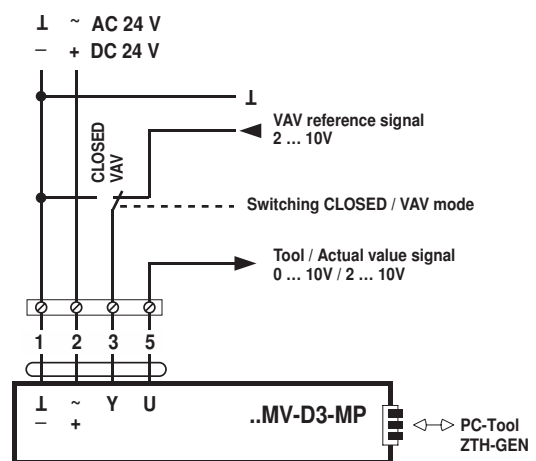
Example 1:

VAV with analogue reference signal



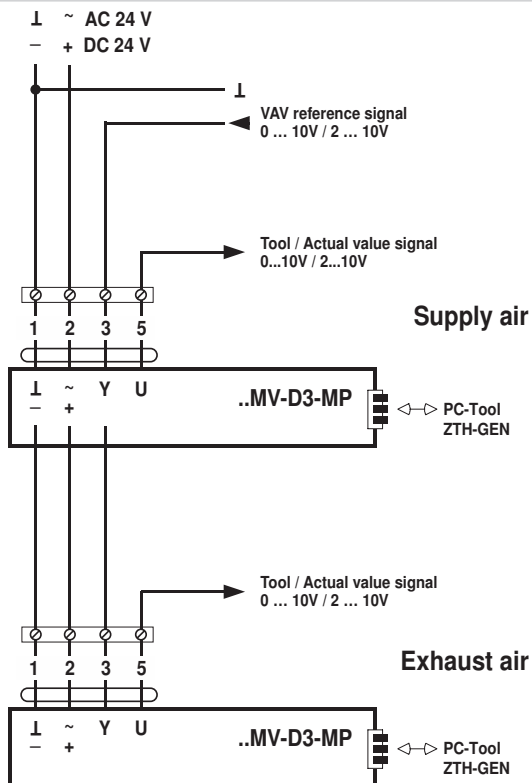
Example 2:

VAV with shut-off (CLOSE), 2 ... 10V mode



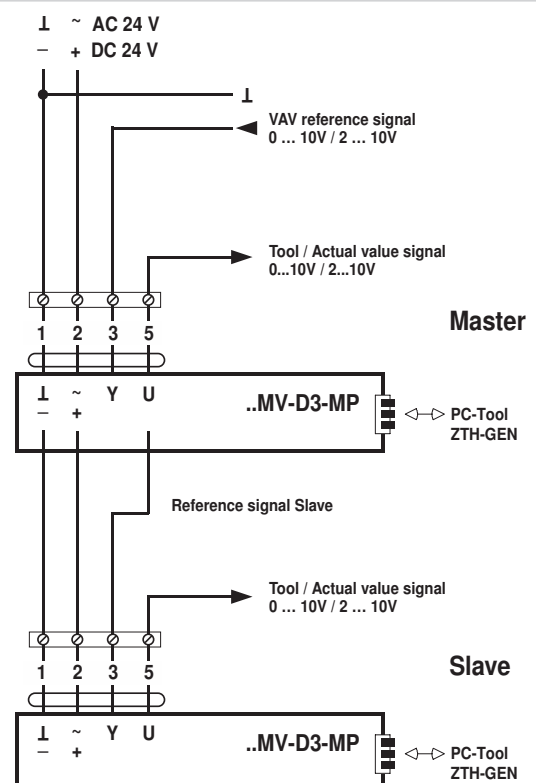
Example 3:

VAV with analogue reference signal supply/exhaust air in parallel operation



Example 4:

VAV with analogue reference signal, in Master/Slave operation



Calculation of actual airflow rate, setting of the requested flow rate U.

Example: Operating mode 0... 10 V

$$\dot{V} = \frac{U \cdot \dot{V}_{nom}}{10}$$

Example: Operating mode 2... 10 V

$$\dot{V} = \frac{U - 2,0}{8} \cdot \dot{V}_{nom}$$

Example: Domain 0... 10 V

Searched for: actual air volume

Voltage measured on U : 3,5 V

$$V_{nom} = 2244 \text{ m}^3/\text{h}$$

$$\dot{V} = \frac{3,5 \cdot 2244}{10} = 785$$

Actual air volume is 785 m³/h.

Example: Operating range 2... 10 V

Searched for: actual air volume

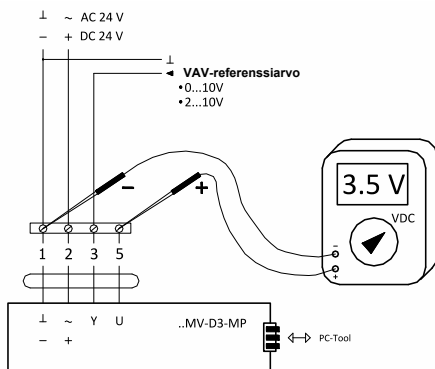
Voltage measured on U: 3.5 V

$$V_{nom} = 579 \text{ m}^3/\text{h}$$

$$\dot{V} = \frac{3,5 - 2,0}{8} \cdot 579 = 109$$

Actual air volume is 109 m³/h.

Determination of the actual value of the connection U using a voltage meter.



Similarly, requested airflow rate should be transferred into Y signal where 2(0) V corresponds to V_{min} and 10 V corresponds to V_{max}

All airflow rates and velocities in the duct are considered with standard air density of 1,2 kg/m³ through this Technical Specifications.



ETS NORD AS

Address: Peterburi tee 53
11415 Tallinn
Estonia

Phone: +372 680 7360
info@etsnord.ee
www.etsnord.ee

ETS NORD Finland

Address: Pakkasraitti 4
04360 Tuusula
Finland

Phone: +358 0401 842 842
info@etsnord.fi
www.etsnord.fi

ETS NORD Sweden

Address: Järsjögatan 7
69235 Kumla
Sweden

Phone: +46 707 80 50 16
info@etsnord.se
www.etsnord.se

ETS NORD Denmark

Address: Nordholmen 6
2650 Hvidovre
Denmark

Phone: +45 6010 1750
info@etsnord.dk
www.etsnord.dk

