

## Nessie® 3/2-Way Zone-Drain-Valves types VDM 2E, VDHT 15E, VDHT 15EC and VDH 30EC "Soft-Charge"



### Generally

The Nessie® 3/2 way valves have in particular been designed for applications in high-pressure humidification and adiabatic cooling systems. Each valve has an IN, OUT and DRAIN port. When the valve is not in operation the connection between IN and OUT is closed while the connection between OUT and DRAIN stays open. This allows to instantaneously relief the pressure at shut down from the application, typically a nozzle branch, to prevent the nozzles from dripping. If desired, the nozzle branch can be entirely drained after shut down to avoid bacterial growth. Furthermore, each valve has its individual properties to match exactly the specific needs in size and functionality.

All Nessie valves are made of stainless steel (AISI 304) and are suitable for potable and technical water. They have an extremely long service life for at least one million operations and are even then very easy to service.

Inline valves are available with European BSP thread (G-thread) and American National Pipe Thread (NPT). For the VDHT 15EC and VDH 30EC Danfoss offers a wide range of single and multiple manifolds.

The enclosure rating is IP 67, including any standard solenoid coil. A large variety of coils for various supply voltages is available for all Nessie valves.

**Generally**  
(continued)

The VDM 2E is a very small and compact valve for minor flow rates up to 1.8 litres per minute (0.5 gpm). It is a direct operated type of valve with just one coil.

It is suitable for systems with many zones with few nozzles and is a very cost effective solution.



The VDHT 15E is a medium size single inline valve for flow rates up to 15 litres per minute (4 gpm). It is based on the latest Nessie valve technology, comprising a piston type NC valve and a NO pilot stage in one housing.

It covers a very wide flow range already starting from 1 litre per minute (0.26 gpm) and is the ideal solution instead of using 2 separate valves (1 NC and 1 NO). The VDHT 15E requires 2 solenoids activated by a common signal (i.e. 24 V AC).



The VDHT 15EC 3/2 is the Cetop 3 variant of the VDHT 15E, by means that connections are made through a valve block or multiple valve manifold. In multiple valve applications up to 5 valves can be installed on a common manifold side by side, saving time, space and plumbing effort.



The VDH 30EC is a highly dedicated valve for demanding applications, i.e. with long pipe runs or very large flow rates up to 30 l/min (8 gpm). It consists of one NC and one NO pilot operated piston type valve in one housing. A very special feature of this valve is the so called "Soft-Charge" functionality; when operating the two solenoid coils with a time delay, the valve works as a flow divider, allowing to fill the application pipes at a reduced flow rate (less pressure). Therewith water hammering and pressure shocks at switch-on and shut-off can be eliminated. Furthermore, the valve is prepared for individual adjustment to a certain flow rate; by inserting an orifice in the OUT (B-) or DRAIN (T-) port the flow diversion can be manipulated.



**HVAC Block**

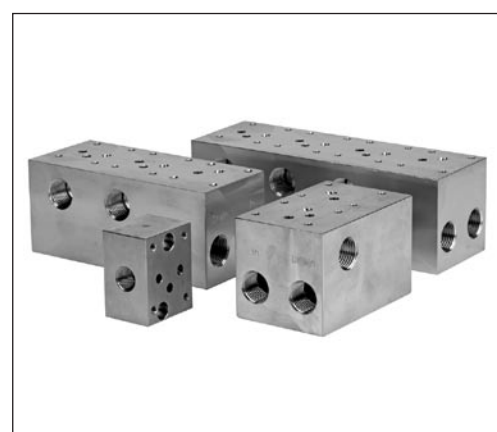
The HVAC blocks are especially designed for in-duct applications where an additional flush valve installed on the block allows to flush the system for improved hygiene. 3 different types are available for 1, 2 or 3 VDHT 15EC or VDH 30EC plus one additional 2/2-way VDHT flush valve. The blocks comprise one common connection for the pressure line from the pump station and one common drain port for pressure relief and flushing. For each discharge an outlet port is available. The HVAC block is a very cost efficient solution i.e. in in-duct systems with 6-step valve control. Each VDH/VDHT valve is operated by two coils (NC and NO), while the flush valve is a single coil NC valve. Please also refer to the list of code numbers on page 5.

*Picture fully equipped blocks 1+1, 2+1 and 3+1*



**Sub-base valve manifolds**

Danfoss offers sub-base manifolds for installing 3, 4 or 5 VDH/VDHT 3/2 way valves side by side. Just as the HVAC blocks, the sub-base manifolds represent a very cost efficient solution, saving significantly on time, space and plumbing effort, as the number of connections is minimized.



*Picture sub-base manifolds and simple inline block*

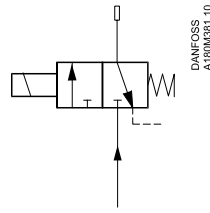
Both multiple valve concepts are very service friendly as the valves can individually be detached from the manifold for service within a few minutes. VDHT 15EC valves can be service while installed on the block.

All manifolds can be connected from both sides, allowing a high level of flexibility for placing them i.e. directly on the pumping station. For a spare block position Danfoss offers a bind plate to cover the connections when not in use.

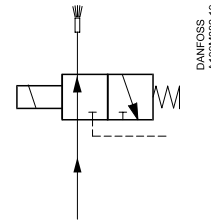
The HVAC block and the multiple valve manifolds are interconnectable, i.e. in systems with more than 5 valves. Danfoss recommends bonded seal fittings for all connections.

3/2-way principle

Solenoid coil(s) de-energized

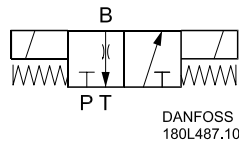


Solenoid coils energized



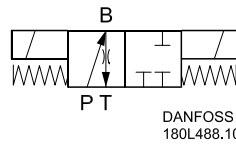
Soft-Charge principle

Both coils de-energized



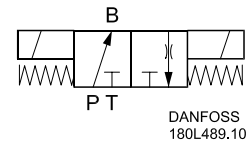
P-port (IN) closed, B- and T-port connected (OUT and DRAIN), application pipe drained

NC coil energized only



P-, T- and B-port (IN, OUT and DRAIN) connected; flow partially to application and drain

Both coils energized



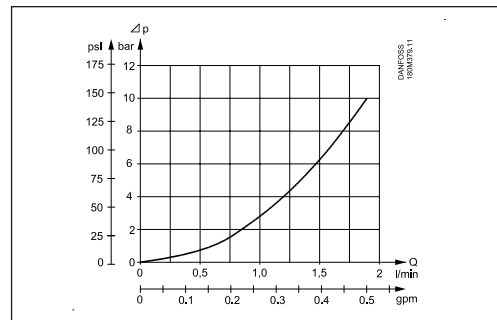
P- and B-port (IN and OUT) connected, T-port (DRAIN) closed, full flow to application

Technical Data

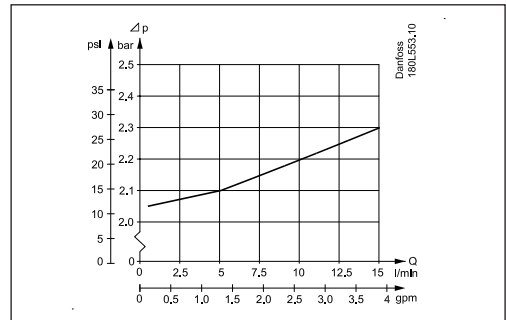
	VDM 2E	VDHT 15E	VDHT 15 EC	VDH 30 EC
Max. continuous inlet pressure in bar/psi	80/1150	140/2000	140/2000	140/2000
Max. peak inlet pressure in bar/psi	100/1450	160/2300	160/2300	160/2300
Min. operation pressure at IN port in bar/psi	0	2/29	2/29	5/73
Drain opening pressure in bar/psi	80/1150	80/1150	80/1150	140/2000
Max. flow IN to OUT in l/min/gpm	1.8/0.5	15/4	15/4	30/8
Min. flow IN to OUT in l/min/gpm	0	1/0.26	1/0.26	2/0.53
Max. flow to DRAIN in l/min/gpm	0.3/0.08	5/1.3	5/1.3	30/8
Opening/closing time in ms	250	250	250	150
Max. water temperature in °C/°F	50/122	50/122	50/122	50/122
Service life	min 1 million operations			
Weight without coil(s) in kg/lbs	1.1/2.4	1.5/3.5	1.5/3.5	2.7/6

Pressure losses at different flows

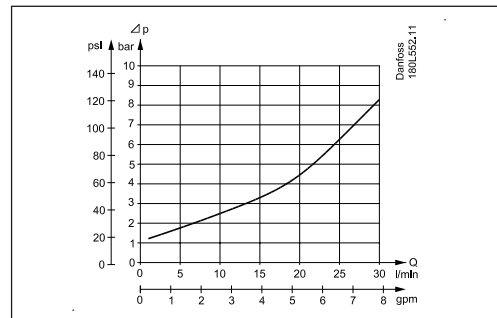
VDM 2E3/2



VDHT 15E3/2, VDHT 15 EC3/2



VDH 30EC3/2



**Code Numbers**

Valves and blocks	Code number
VDM 2E G ¼"	180L3006
VDM 2E ¼" NPT	180L3007
VDHT 15E G ¾, ¾, ¼"	180L0173
VDHT 15E 3 × ¾" NPT	180L0174
VDHT 15EC (Cetop 3)	180L0240
VDH 30EC (Cetop 3)	180L0051
Single in-line block G ¾" for VDHT 15 EC or VDH 30EC	180L0200
Single in-line block ¾" NPT for VDHT 15 EC or VDH 30EC	180L0201
HVAC block 1+1 (1 valve + flush valve)	180L0181
HVAC block 2+1 (2 valves + flush valve)	180L0182
HVAC block 3+1 (3 valves + flush valve)	180L0183
VDHT 30EC NC 2/2-way (flush valve)	180L0096
Sub-base manifold for 3 VDHT 15EC/VDH 30EC	180L0261
Sub-base manifold for 4 VDHT 15EC/VDH 30EC	180L0262
Sub-base manifold for 5 VDHT 15EC/VDH 30EC	180L0263
Blind plate (to cover spare position)	180L0079

Coils	Supply Voltage	Power	Code number
Standard clip-on coils NC+NO	24 V/50 Hz	10 W	018F7920
	220V/50 Hz	10 W	018F7921
	240V/50 Hz	10 W	018F7924
	24 V/60 Hz	10 W	018F7922
	110 V/50/60 Hz	10 W	018F7923
	220 V/60 Hz	10 W	018F7925
	240 V/60 Hz	10 W	018F7926
UL Recognized (UR) coils NC+NO	24 V/50/60 Hz	14 W	018F7907
	110 V/50/60 Hz	14 W	018F7909
	208-240 V 50/60 Hz	14 W	018F7908
Plug for UR coils with DIN spade	all voltages		180Z0183

Service parts	Code number
Service kit for VDM 2E	180Z0041
Piston kit for VDHT 15E NC	180Z0015
Piston kit for VDH 30EC NC+NO	180L5005

**Water Quality, Filtration**

All types of Nessie valves are suitable for operation with potable water or technical water such as reverse osmosis water, de-mineralised water or de-ionised water.

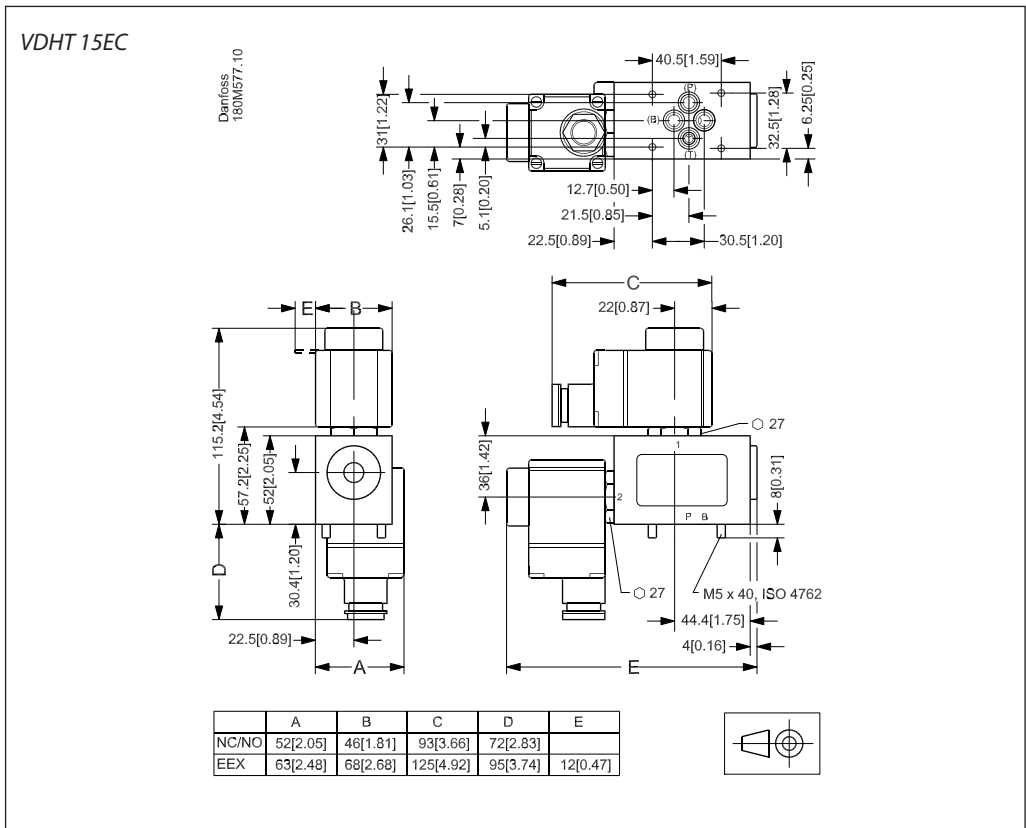
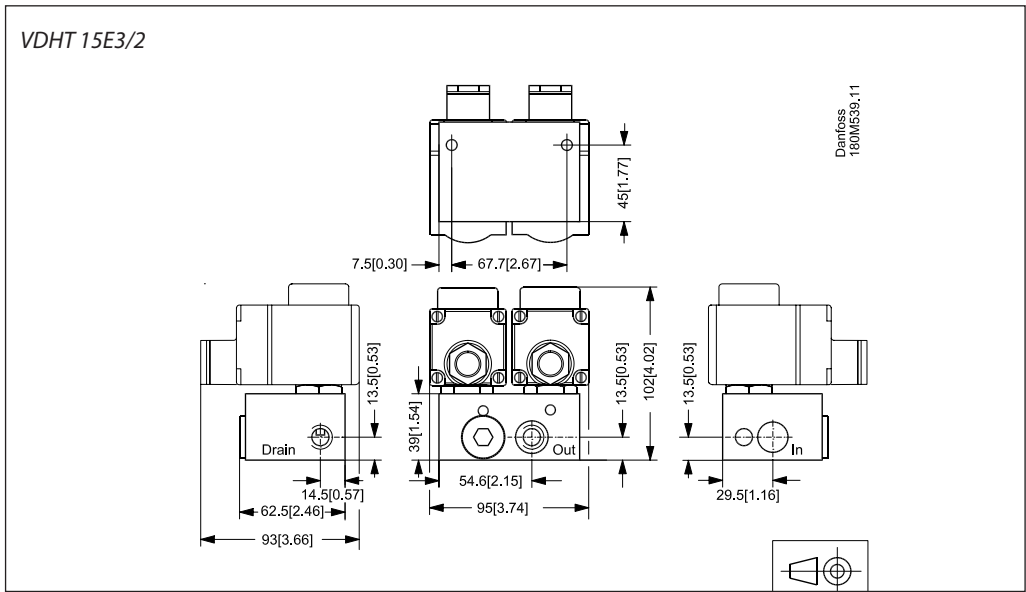
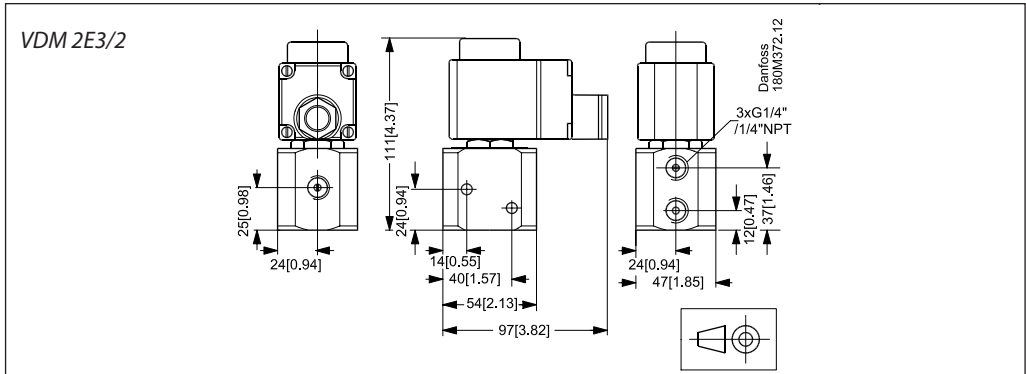
The water must be filtered to a minimum of 10 µm absolute.

**Installation**

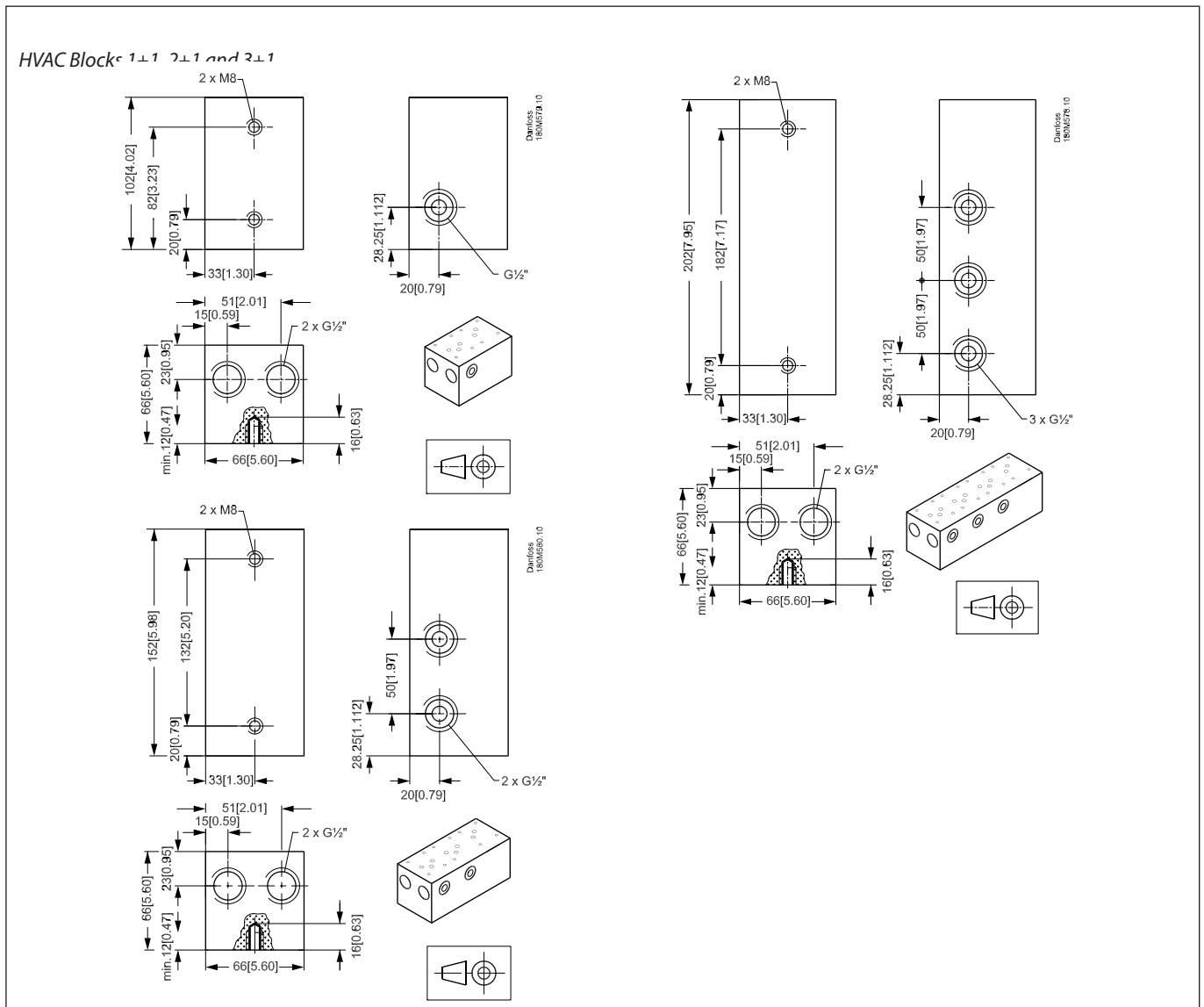
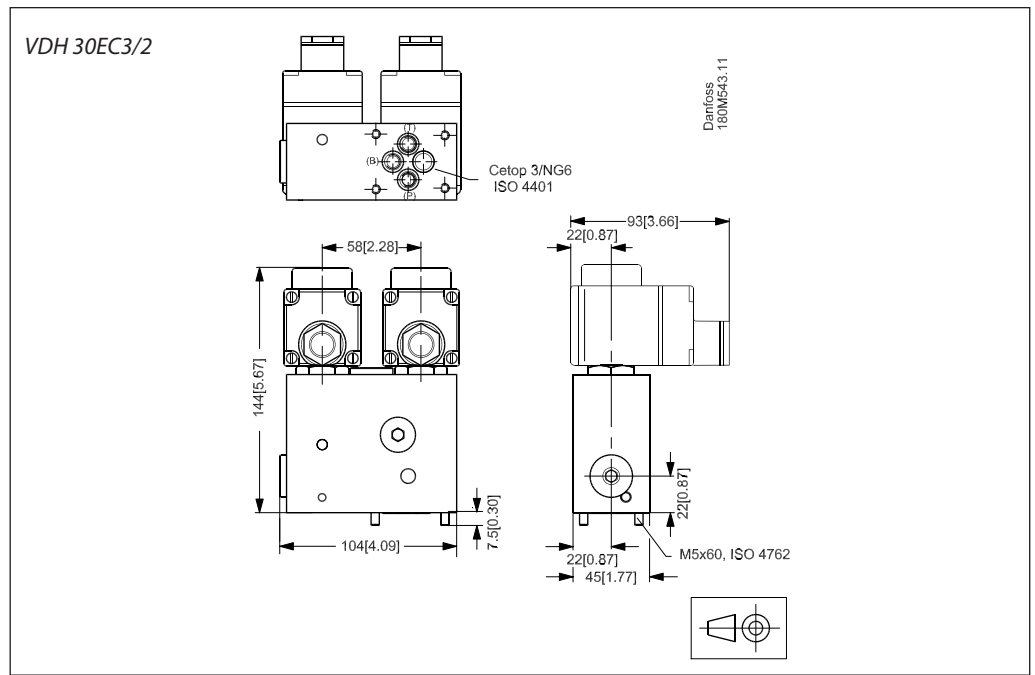
The VDM 2E and VDHT 15E can be mounted self-supporting by the pipes or can be mounted with 2 bolts to any surface (see below).

The VDHT 15EC and VDH 30EC are installed according to the Cetop standard. 4 bolts and O-rings for block mounting are supplied with the valve.

Dimensions, mm (in)

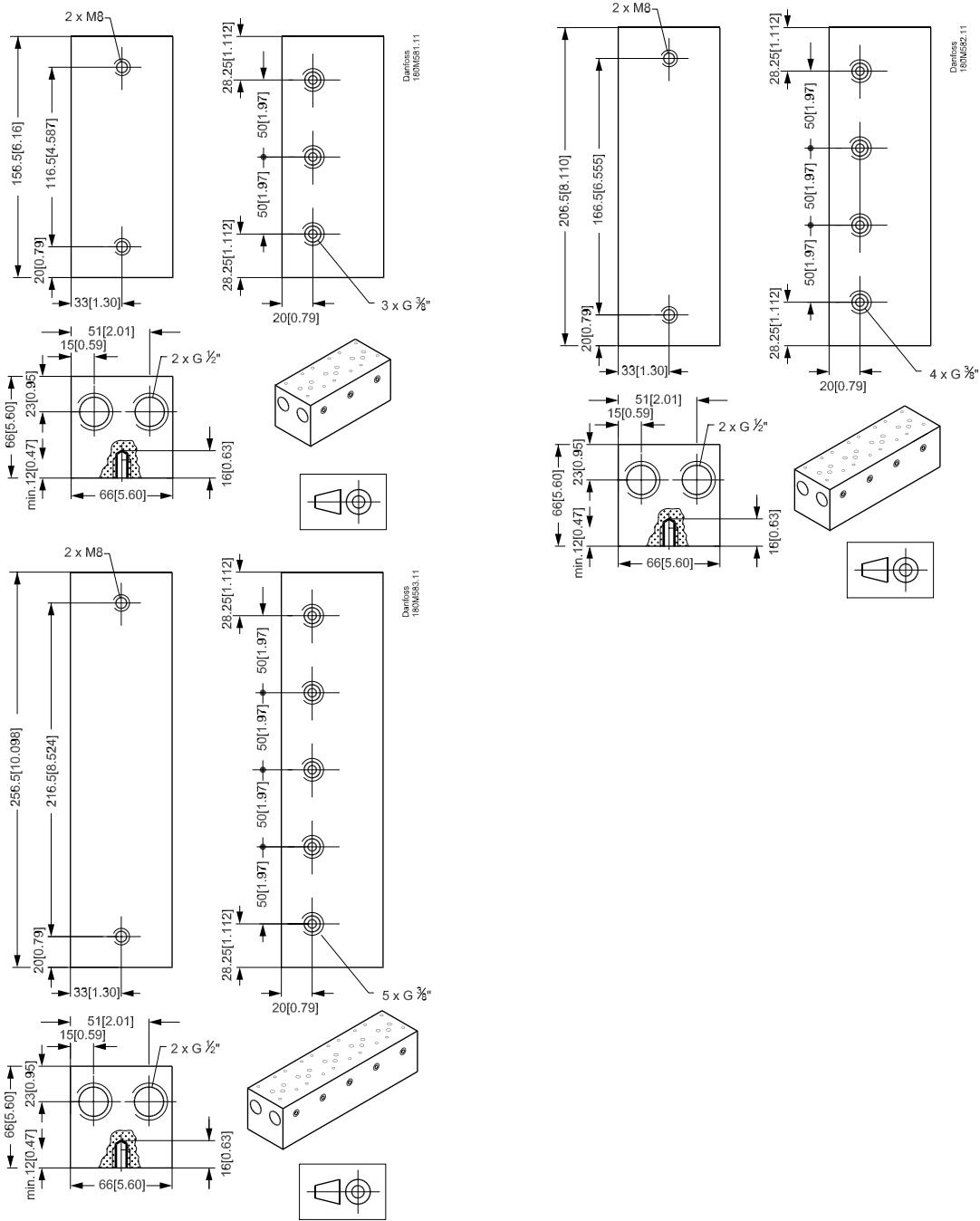


Dimensions, mm (in)



Dimensions, mm (in)  
- Manifolds

Multiple blocks for 3, 4 and 5 valves VDHT/VDH



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