

D-17
CATALOG

Vogt®

Desuperheaters
Power





1890...

In the late 1890s, Vogt pioneered the early development of ammonia absorption refrigeration systems that made artificial ice.

This business, plus Vogt's emerging boiler business, created an internal need for quality valves that initiated Vogt's early entry into the valve manufacturing.

The early reputation of Vogt's quality valves and rapidly growing petroleum processing industry created an outside demand that would firmly establish Vogt in the mass production of high-quality forged steel valves.

For more than 100 years, Vogt's leadership has been evident in the production of forged steel gate, globe, angle and check valves in most popular materials, trims and bonnet configurations.

...2017

The OMB Valves group acquired in July 2017. In January 2018 the manufacturing facilities were relocated to Stafford TX in a brand new plant of 100,000 sq.ft. and a second plant for specialty valves opened in Milan, Italy.

Today Vogt Valves supports a worldwide network of distributors and customers with access to the world's largest capability for manufacturing of forged steel valves.

OMB Valves group

OMB Valves, headquartered in Cenate Sotto, Bergamo, Italy, is a diversified manufacturer of valves for the energy industries.

Founded by Mr. Roberto Brevi in 1973, OMB is a family owned and operated group which has become a globally recognised valve manufacturer with operations in Europe, Asia, USA and Middle East supported by a worldwide distribution network.

N1/N2 Fixed Area Nozzle Series

Fixed area / full cone / hollow cone

PRODUCTS FEATURES

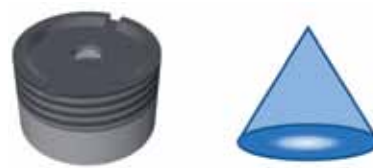
N1 SERIES

- Fixed Area Nozzles (full cone spraying pattern)
- Fully Sealed construction
- Internally locked turbulator
- Threaded connection
- Up to 30 bar working pressure drop
- Stainless Steel
- Various capacities



N2 SERIES

- Fixed Area Nozzle (hollow cone spraying pattern)
- Two-pieces construction
- Separate turbulator and diffuser hole
- Screwed connection
- Up to 30 bar working pressure drop
- Nitrided austenitic steel
- Various capacities

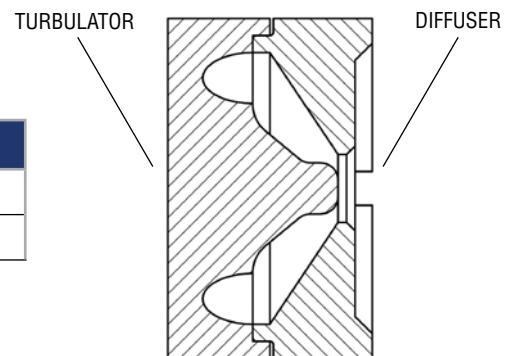


N2 Nozzles

Product Details

CHARACTERISTICS

- Two-pieces design
- High strength due to nitriding process
- Separate turbulator and calibrated orifice
- Screwed connection to desuperheating probe head
- Extended range of flow capacities
- Extremely good water atomization quality
- Variable and smooth water feeding thanks to dedicated feeding system (on probe type desuperheater only)



POS.	PART NAME	MATERIAL
1	TURBULATOR	F6NM Nitrided
2	DIFFUSER	F6NM NITRIDED

FIXED AREA NOZZLE CAPACITY & SIZE								
SIZE	1	2	3	4	5	6	7	8
N1 Capacity (Cv)	0.030	0.040	0.060	0.080	0.10	0.12	0.14	0.17
N2 Capacity (Cv)	0.013	0.026	0.075	0.160	0.30	0.45	0.65	0.90

N3 Variable Area Nozzle Series

Spring assisted / Hollow cone

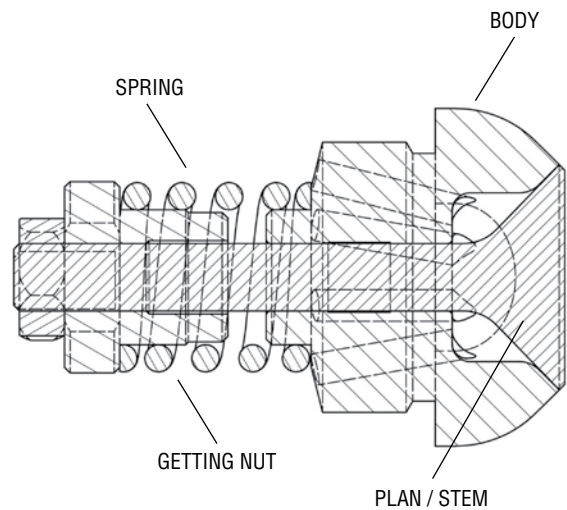


PRODUCT FEATURES

- Variable Area Nozzles
- Spring loaded piston with settable spring load (typical set: 3.0 bar)
- Integral turbulator upstream annular discharging section to increase atomization quality
- Available in different nozzle diameters and capacities
- Perfect sealing when closed thanks to accurate surfaces machining and spring-to-close design
- Hardened plug for friction reduction and lasting performance
- Working pressure drops up to 30 bar for continuous services and 40 bar for occasional use
- Easy maintenance thanks to threaded connections
- Available as probe and wall mounted assembly
- Water control valve installed upstream desuperheater can provide required flow without fall into cavitating conditions thanks to counterpressure ensured by spring load (depending on spring set)

PART LIST AND MATERIALS

POS.	PART NAME	MATERIAL
1	BODY	SA105 / SA182 F22 / SA182 F91
2	PLUG-STEM	F6NM Nitrided
3	SPRING	Inconel X-750
4	SETTING NUT	AISI304 Annealed
5	PIN	AISI 304
6	LOCKING GASKET	AISI304 Annealed



SPRING SETTING

SPRING SET RANGE				
bar	1.0	2.0	3.0(*)	5.0

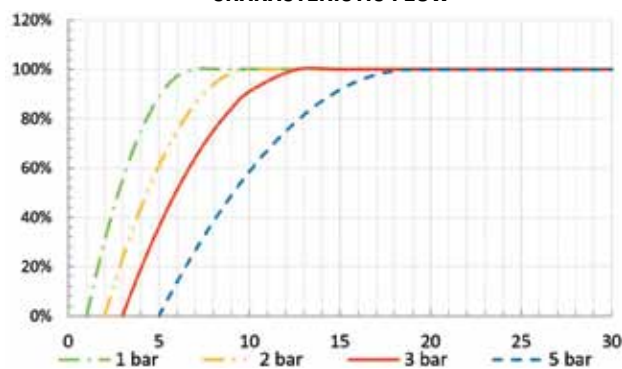
(*) Standard selection

NOZZLES CAPACITIES

NOZZLES SIZE	1	2	3	4	5
Available Cv	1.0	1.5	3.3	6.2	9.0
Pressure Drop Range (*)	0.5-30	0.5-30	0.5-30	0.5-30	0.5-30
Rangeability	30:1	30:1	30:1	30:1	30:1

(*) Up to 40 bar for short period use

CHARACTERISTIC FLOW

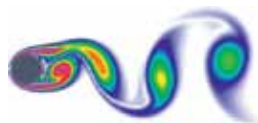


VDH-V1

Probe Type Desuperheaters

CHARACTERISTICS

- Probe with fixed or variable area nozzles
- Water injection on steam pipe axis to increase desuperheating efficiency
- Spherical head allows to improve steam flow around nozzle
- Flanged construction to ensure easy maintenance and quick nozzles inspection
- Single or multiple nozzles on a single probe available
- Wide range of nozzles with various flow capacities
- Multiple probes installation allowed for use in parallel, split-range or as backup/emergency water injection system
- Optimized probe shape and fabrication process to avoid vibration during service (due both to reaction caused by water injection and Von Karman vortex shedding)
- High thermal shocks tolerance for most severe not-continuous service



Typical vortex shedding downstream conventional cylindrical probes



(*) Standard selection



PRODUCT CODE

PRODUCT CODE	VARIABLE AREA	FIXED AREA
PROBE MOUNTED	VDH-V1	VDH-F1
WALL MOUNTED	VDH-V1	VDH-F1

FIXED AND VARIABLE AREA - PROBE MOUNTING DETAILS

VARIABLE AREA NOZZLE SIZE (PROBE INSTALLATION)					
SIZE	1	2	3	4	5
Pressure drop range (bar)	0.5÷30	0.5÷30	0.5÷30	0.5÷30	0.5÷30
Number of nozzles per probe	1÷3	1÷3	1÷3	1÷3	1÷3
Steam pipe connection flange (DN)	2"	3"	4"	4"	6"
Minimum Steam pipe diameter (DN)	4"	6"	8"	8"	12"
Water Connection flange (DN)	1/2", 1"	1"	1.1/2"	2"	3"

VDH-V2

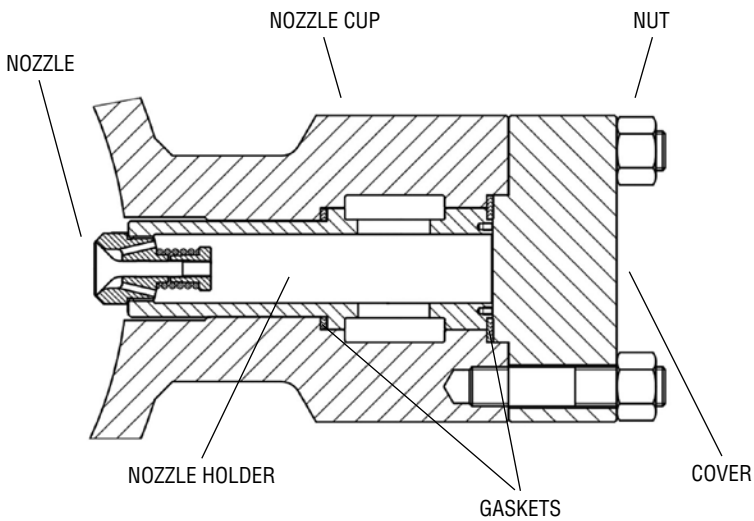
Wall Mounted Variable Area desuperheater

CHARACTERISTICS

- Water injection from pipe wall provided with variable area nozzles
- Natural back-flow prevention due to spring return nozzles design
- No reduction of main pipe sectional area
- Nozzles protected from main flow impingement
- External water collector with flanged or welded connection
- Free expanding design of water collector
- Water injection on multiple section available
- Easy maintenance of each single nozzle thanks to back flange
- Totally customized water connection position



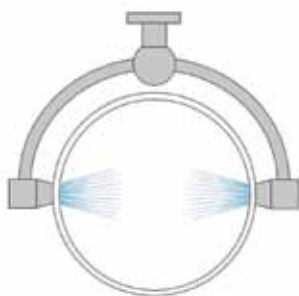
COMPONENTS AND MATERIALS



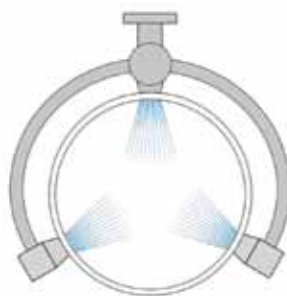
POS.	PART NAME	MATERIALS
1	NOZZLE	SUB ASSEMBLY (Various materials)
2	NOZZLE HOLDER	SA 182 F6NM
3	COVER	SA 105
4	GASKET	AISI 321 / 316 + GRAPHITE
5	WASHER	AISI 304
6	STUD	A 193 B7
7	NUT	A 194 Gr.4

INSTALLATION EXAMPLES

To avoid water impingement on internal pipe walls, nozzles shall be installed in symmetrical configuration. Different solution are shown here below. One or more sections can be installed on the same pipe to achieve the desired number of nozzles and total capacity.



2 Nozzles



3 Nozzles



4 Nozzles



6 Nozzles

VDH-I

Integrated type desuperheater

CHARACTERISTICS

- Fully embedded water spraying system including valve and actuation system in probe configuration
- Constant pressure drop working principle with fixed area nozzles
- Customized spraying head with variable number of atomizers for tailor made flow capacities
- Seat ring located close to desuperheating fluid inlet flange working at lower temperatures
- Inlet flange can be oriented by 30, 45, 90 degrees independently from spraying direction and according to flange drilling pattern.
- Easy maintenance thanks to threaded and flanged connections
- Packing PTFE or Graphite also with self adjusting system
- Diaphragm Pneumatic Actuator as standard, Electric, Hydraulic and other actuators on request

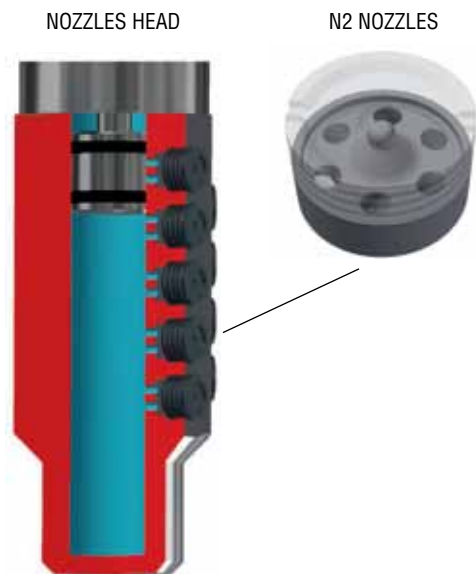
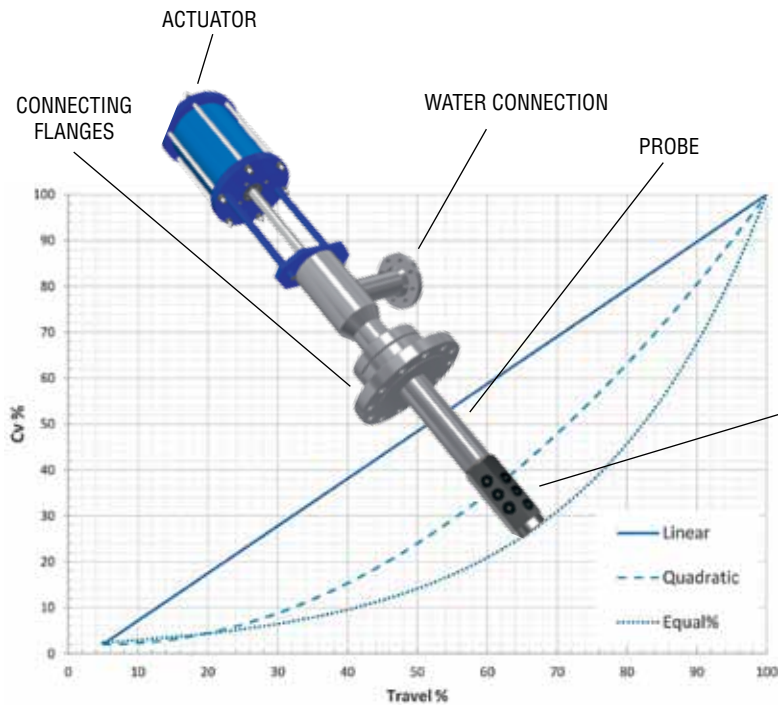


MODULAR CONFIGURATION

- Nozzles capacities can be varied and combined to achieve the desired total capacity and characteristic flow

PRODUCT CODE

PRODUCT CODE	INTEGRATED TYPE
PROBE MOUNTED	VDH-V1



INSTALLATION

- Water connection can be oriented according to Customer requirements

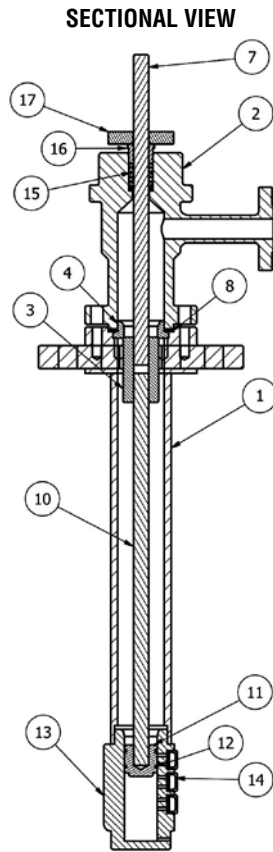


EXTENDED POSSIBILITIES

- In order to extend Rangeability and maximum water flow, it is possible to install a twin system composed by two desuperheating probes, installed on the same plane (for example tilted of 30-45° with respect to vertical axis) and controlled in parallel, split-range or occasionally switched for safety-related redundancy function.

TECHNICAL DATA FOR INSTALLATION

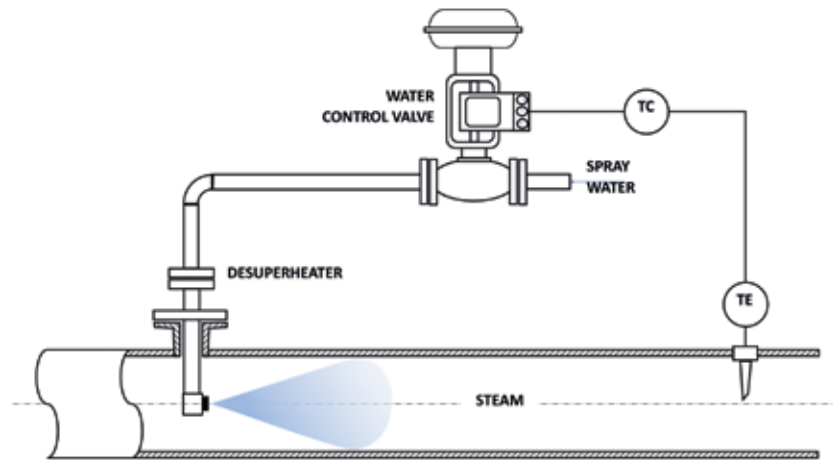
VDH-I - INTEGRATED DESUPERHEATER					
SIZE	Unit-Ref.	1	2	3	4
Water Connection	DNw [In]	1"	1.1/2"	2"	3"
Steam Connection	DNS [In]	3"	3" – 4"	4" – 6"	6" – 8"
Water Pipe Class / Rating	UNI ANSI	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#
Stem Pipe Class / Rating	UNI ANSI	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#	PN16 - PN250 150# - 1500#
Materials of construction	-	Carbon Steel CrMo	Carbon Steel CrMo	Carbon Steel CrMo	Carbon Steel CrMo
Cv Capacity Range	Cv	0.1 – 4.0	0.1 – 4.0	0.1 – 4.0	0.1 – 4.0
Plug stroke	[mm]	45	60	100	100
Max Nozzles number	Nz	8	12	16	20
Rangeability (Max)	R	40	45	50	50
Pressure drop working range (W/S)	[bar]	1.8 – 70	2.2 – 70	2.6 – 70	3.0 – 70
Feeding Water Max velocity	[m/s]	7.0	7.0	6.5	6.0
Min. Steam velocity (injection point)	[m/s]	8.0	9.0	10.0	12.0



CONSTRUCTION MATERIALS

POS.	PART NAME	MATERIAL		
		A	B	C
1	PROBE	SA182 F316	SA182 F22	SA182 F91
2	BODY	SA182 F316"		
3	PLUG	SA182 F316	A564-630 H900	
4	SEAT	SA182 F316+ Stellite	A 479 F6NM+ Stellite	
5	STUD	SA193 B8M Cl.1	SA193 B7	SA193 B16
6	NUT	SA194 Gr.8	SA194 Gr.2H	SA194 Gr.8
7	MAIN STEM	A479 XM.19		
8	A479 XM.19	Spiral Wound AISI 316 / 321 + Graphite		
9	PIN	A 479 316L		
10	DRIVEN STEM	A479 XM.19		
11	A479 XM.19	SA182 F316 Nitrided	SA182 F316 Nitrided	
12	PISTON RING	A 479 XM.19	A 439 type D3	
13	COLLECTOR	SA182 F316 Nickel plated	A 479 F6NM Nitrided	
14	A 479 F6NM Nitrided	SA182 F316 Nitrided	A 479 F6NM Nitrided	
15	A 479 F6NM Nitrided	PTFE	PTFE	

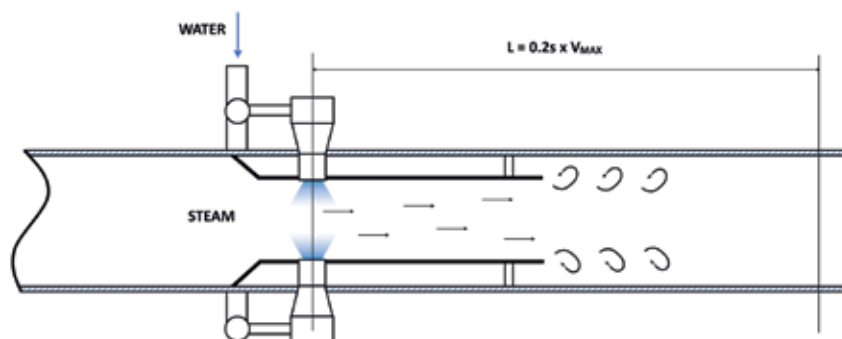
DESUPERHEATER INSTALLATION



RULES

In order to achieve the best desuperheating efficiency, some basic rules shall be adopted for the installation.

1. Minimum straight pipe upstream desuperheating section: $5 \times DN_{pipe}$ (minimum 0.5 m)
2. Minimum straight pipe length downstream desuperheating section: 6 m
3. Long radius ($R \geq 3DN$) is recommended for first bend downstream desuperheater
4. Minimum distance of Temperature Sensor: 12 m
5. Superheated flow velocity shall be kept above minimum values given for each desuperheater
6. Final temperature of desuperheated flow shall be at least $10^{\circ}C$ above saturation temperature at outlet pressure
7. Suitable draining line shall be located in the lower part of pipe section where desuperheating fluid is injected and piping slope shall be suitable to collect unevaporated fluid into the draining pot
8. In case of possibility of thermal shocks, piping should be provided with internal protection layer
9. To furtherly improve atomization efficiency it is suggested to increase of about 1m (or 3DN) the straight pipe upstream injection point and 1.0 m downstream.



The logo for Vogt, featuring the word "Vogt" in a bold, dark blue, sans-serif font with a registered trademark symbol (®) to the upper right of the letter 't'.

Vogt[®]

Atomizing Nozzles and Desuperheaters
for **POWER APPLICATIONS**

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