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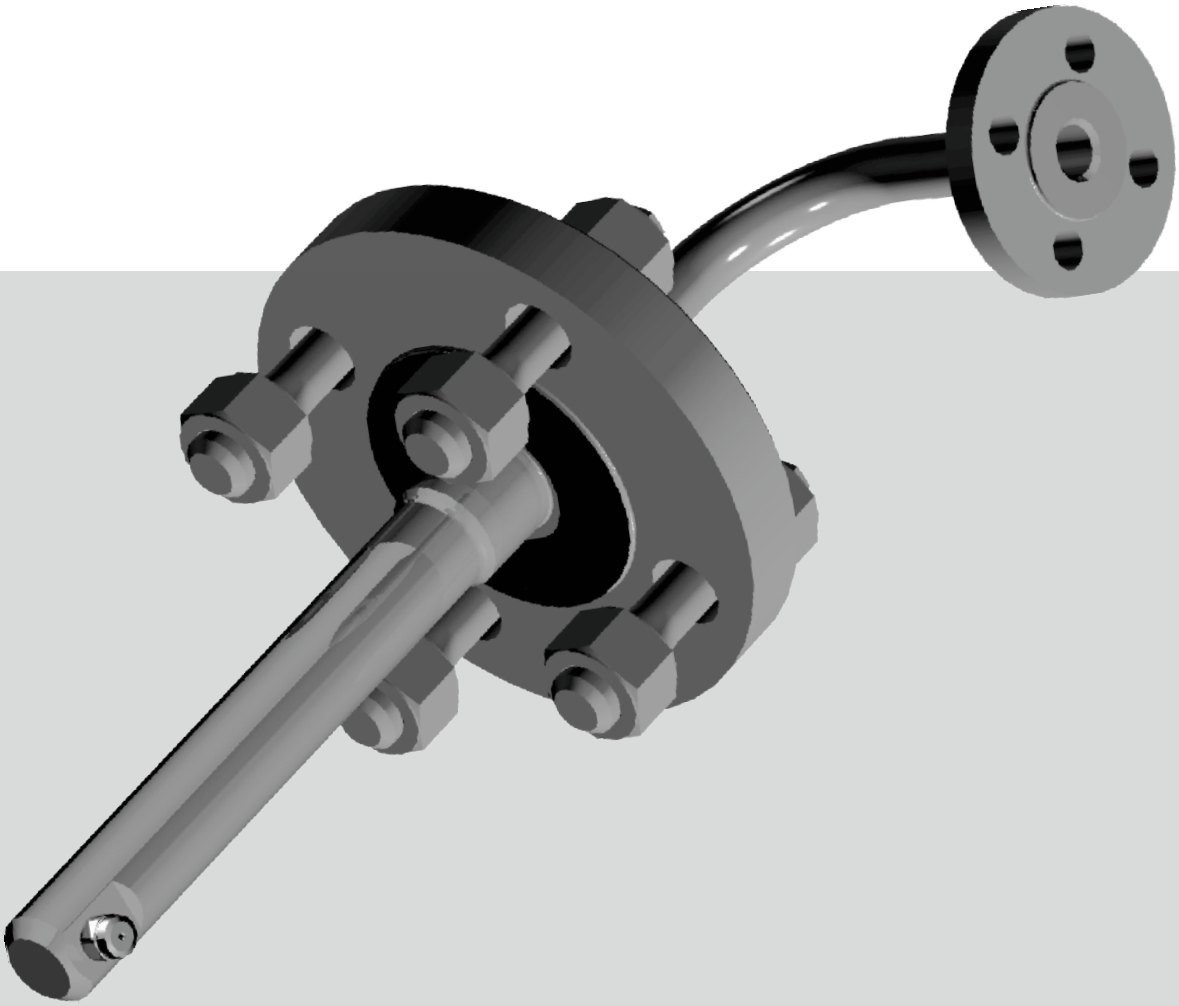
INJECTION HEAD
VHF



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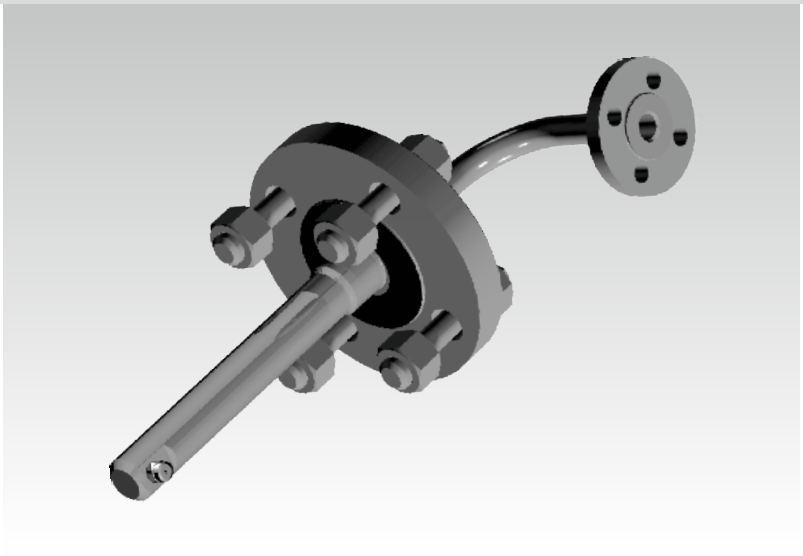


VHF

Injection head

DN 15 to 25
PN 16 to 400

Description

Injection head (further VHF) is a device designed to regulate the temperature of the steam. VHF is equipped with one to three nozzles with fixed geometry, that works on the mechanical principle of atomizing. Two types of nozzles are used. Type H serves for injecting a higher water quantity where a full cone of bigger droplets of injected water is created. Type M utilizes a high pressure drop across the nozzle for very fine spraying of the injected water. This design is not recommended for control ranges higher than 1 : 4.

VHF is supplied with connection to the steam line using a flange DN50 or DN65, PN100 to 400. The injection water connection is flanged.

Process media

VHF is designed to inject cooling water without mechanical impurities. Application of VHF for other process media must be considered with regard to the used material that is in contact with medium and it is recommended to consult it with the producer.

For the correct function of the VHF, the manufacturer recommends inserting a filter of mechanical impurities into the pipeline in front of the control valve of the injected water, or in another suitable way to ensure that the injected medium does not contain abrasive admixtures or other mechanical impurities.

Application

VHF is designed for precise and economic injection of cooling water into steam. VHF is especially designed for industrial applications such as production of low-pressure steam or stem production in technology.

VHF is designed for steam lines DN80 and larger.

Installation

VHF must be installed into pipeline always the way so that the flow of cooled medium will coinside with the arrows indicated on the flange.

As far as the dismantling is considered, it is recommended to leave free space of min. Height that is equal to the distance between flange lower edge and end point of body bent (length "L"). VH can be piped in horizontal, vertical or inclined pipeline in any position.

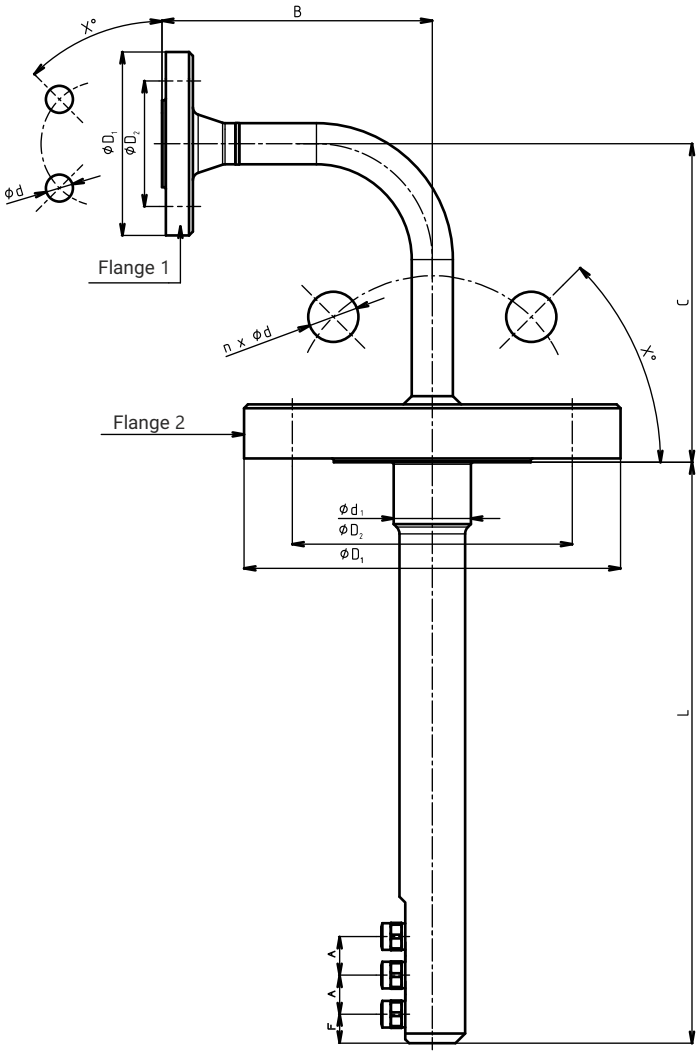
Detailed instructions for installation are given in document *„Instruction for Installation and Maintenance"* and in *„Heat balance calculation"* which is a part of the offer.

Technical data

Series		**VHF**	
Version		**Injection head with 1,2 or 3 nozzles**	
Flange 1 (water connection)	nominal diameter	DN 15 to 25	
	nominal pressure	PN 16 to 400	
Flange 2 (steam line)	nominal diameter	DN 50	
	nominal pressure	PN 100 to 400	
Body and flanges material		Cast steel 1.0425 (P265GH) / 1.0426 (P280GH)	20 to 480 °C
		Alloy steel 1.7335 (13CrMo4-5)	20 to 550 °C
		Alloy steel 1.7380 (10CrMo9-10) / 1.7383 (11CrMo9-10)	20 to 600 °C
		Stainless steel 1.4922 (X20CrMoV11-1)	20 to 600 °C
Flanges		acc. to ČSN EN 1092-1 (07/2013)	
Operating pressures		acc. to ČSN EN 12516-1 (08/2015)	

Nozzle size table

Type	Size	Kvs	Δp_{MAX} [bar]	Flange 2
M	1	0,002	70	DN 50
	2	0,004		
	3	0,007		
	4	0,009		
	6	0,014		
	8	0,018		
	10	0,023		
	12	0,027		
	14	0,032		
	18	0,041		
	20	0,045		
	22	0,050		
	26	0,059		
H	3	0,076	10	DN 65
	5	0,125		
	6	0,164		
	10	0,250		
	15	0,377		
	22	0,563		



Connection dimensions

Flange 1

DN	n	X°	PN 16 - 40			PN 63 - 160			PN 250			PN 320			PN 400		
			D1	D2	d	D1	D2	d	D1	D2	d	D1	D2	d	D1	D2	d
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
15	4	45	95	65	14	105	75	14	130	90	18	130	90	18	145	100	22
25	4	45	115	85	14	140	100	18	150	105	22	160	115	22	180	130	26

Flange 2

DN	PN 100, 160				PN 250				PN 320				PN 400			
	D1	D2	n	d	D1	D2	n	d	D1	D2	n	d	D1	D2	n	d
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
50	195	145	4	26	200	150	8	26	210	160	8	26	235	180	8	30
65	220	170	8	26	230	180	8	30	255	200	8	30	290	225	8	33

DN	d_1	A	F	B					C	L_{max}
				PN 16-40	PN 63-160	PN 250	PN 320	PN 400		
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
15	40	15	20	140	147	162	162	170	167	385
25	40	15	20	192	210	217	230	242	215	385

Valve complete specification No. for ordering VHF

			XXX	X	XXX	/	XXX	-	XXX	/	XXX	X	X	X	X	XX	XXX
Series	Injection head		**VHF**														
No. of nozzles	According to version 1, 2 or 3 nozzles			**X**													
DN (steam line connect.)	DN - acc. to version				**XXX**												
DN water	DN - acc. to version						**XXX**										
PN (steam line connect.)	PN - acc. to version								**XXX**								
PN water	PN - acc. to version										**XXX**						
Connection (steam line)	Raised flange											**1**					
	Flange with ring											**2**					
	Plain flange											**3**					
Connection (water)	Raised flange												**1**				
	Flange with ring												**2**				
	Plain flange												**3**				
Material	1.0425 (P265GH) / 1.0426 (P280GH)	(20 až 500 °C)												**1**			
	1.7335 (13CrMo4-5)	(20 až 550 °C)												**2**			
	1.7380 (10CrMo9-10)/1.7383 (11CrMo9-10)	(20 až 600 °C)												**6**			
	1.4922 (X20CrMoV11-1)	(20 až 600 °C)												**7**			
	Other material													**9**			
Nozzle type	Type H or M														**X**		
Nozzle size	Acc. to size table															**XX**	
Lenght L	Acc. to version (max 385 mm)																**XXX**

Ordering example: Injection head with 1 nozzle - type H, size 2, connection to steam line. DN 50, PN 100, with flange for injection water connection; DN 25, PN 160 type B1; body material - alloy steel 1.7335 is marked as follows: **VHF1 050/025-100/160 112 H02 360**

Note: The delivery includes connecting material and an intermediate flange seal for connection to the steam line

Max. permissible operating pressures [MPa]

Material	PN	Temperature [°C]											
		100	150	200	250	300	350	400	450	480	500	550	600
Cast steel 1.0425 / 1.0426	**16**	1.5	1.42	1.34	1.23	1.11	1.04	0.96	0.59	0.36	---	---	---
	25	2.34	2.22	2.10	1.92	1.74	1.62	1.50	0.92	0.56	---	---	---
	40	3.74	3.55	3.36	3.07	2.78	2.59	2.40	1.47	0.90	---	---	---
	63	5.90	5.59	5.29	4.84	4.38	4.08	3.78	2.32	1.41	---	---	---
	100	9.36	8.88	8.40	7.68	6.96	6.48	6.00	3.68	2.24	---	---	---
	160	14.9	14.2	13.4	12.2	11.1	10.3	9.60	5.89	3.59	---	---	---
	250	23.4	22.2	21.0	19.2	17.4	16.2	15.0	9.20	5.60	---	---	---
	320	29.9	28.4	26.8	24.5	22.2	20.7	19.2	11.7	7.17	---	---	---
	400	37.4	35.5	33.6	30.7	27.8	25.9	24.0	14.7	8.96	---	---	---
Alloy steel 1.7335	**16**	1.6	1.6	1.6	1.6	1.6	1.49	1.37	1.26		1.0	0.47	---
	25	2.5	2.5	2.5	2.5	2.5	2.33	2.13	1.97		1.56	0.73	---
	40	4.0	4.0	4.0	4.0	4.0	3.73	3.41	3.15		2.5	1.17	---
	63	6.3	6.3	6.3	6.3	6.3	5.87	5.38	4.97		3.93	1.85	---
	100	10.0	10.0	10.0	10.0	10.0	9.31	8.53	7.89		6.24	2.93	---
	160	16.0	16.0	16.0	16.0	16.0	14.9	13.6	12.6		9.99	4.70	---
	250	25.0	25.0	25.0	25.0	25.0	23.2	21.3	19.7		15.6	7.34	---
	320	32.0	32.0	32.0	32.0	32.0	29.8	27.3	25.2		19.9	9.39	---
	400	40.0	40.0	40.0	40.0	40.0	37.2	34.1	31.5		24.9	11.7	---
	630	63.0	63.0	63.0	63.0	63.0	58.7	53.8	49.7		39.3	18.5	---
Alloy steel 1.7380 / 1.7383	**16**	1.6	1.6	1.6	1.6	1.6	1.5	1.37	1.26		1.05	0.56	0.24
	25	2.5	2.5	2.5	2.5	2.5	2.35	2.13	1.97		1.65	0.88	0.37
	40	4.0	4.0	4.0	4.0	4.0	3.75	3.41	3.15		2.63	1.41	0.6
	63	6.3	6.3	6.3	6.3	6.3	5.91	5.38	4.97		4.15	2.22	0.94
	100	10.0	10.0	10.0	10.0	10.0	9.38	8.53	7.89		6.58	3.52	1.49
	160	16.0	16.0	16.0	16.0	16.0	15.0	13.6	12.6		10.5	5.63	2.39
	250	25.0	25.0	25.0	25.0	25.0	23.4	21.3	19.7		16.4	8.80	3.73
	320	32.0	32.0	32.0	32.0	32.0	30.0	27.3	25.2		21.0	11.2	4.78
	400	40.0	40.0	40.0	40.0	40.0	37.5	34.1	31.5		26.3	14.0	5.98
Stainless steel 1.4922	**16**	1.6	1.6	1.6	1.6	1.6	1.5	1.37	1.26		1.05	0.9	0.42
	25	2.5	2.5	2.5	2.5	2.5	2.35	2.13	1.97		1.65	1.46	0.65
	40	4.0	4.0	4.0	4.0	4.0	3.75	3.41	3.15		2.63	2.33	1.05
	63	6.3	6.3	6.3	6.3	6.3	5.91	5.38	4.97		4.15	3.67	1.65
	100	10.0	10.0	10.0	10.0	10.0	9.38	8.53	7.89		6.58	5.82	2.61
	160	16.0	16.0	16.0	16.0	16.0	15.0	13.6	12.6		10.5	9.32	4.18
	250	25.0	25.0	25.0	25.0	25.0	23.4	21.3	19.7		16.4	14.5	6.54
	320	32.0	32.0	32.0	32.0	32.0	30.0	27.3	25.2		21.0	18.6	8.37
	400	40.0	40.0	40.0	40.0	40.0	37.5	34.1	31.5		26.3	23.3	10.4

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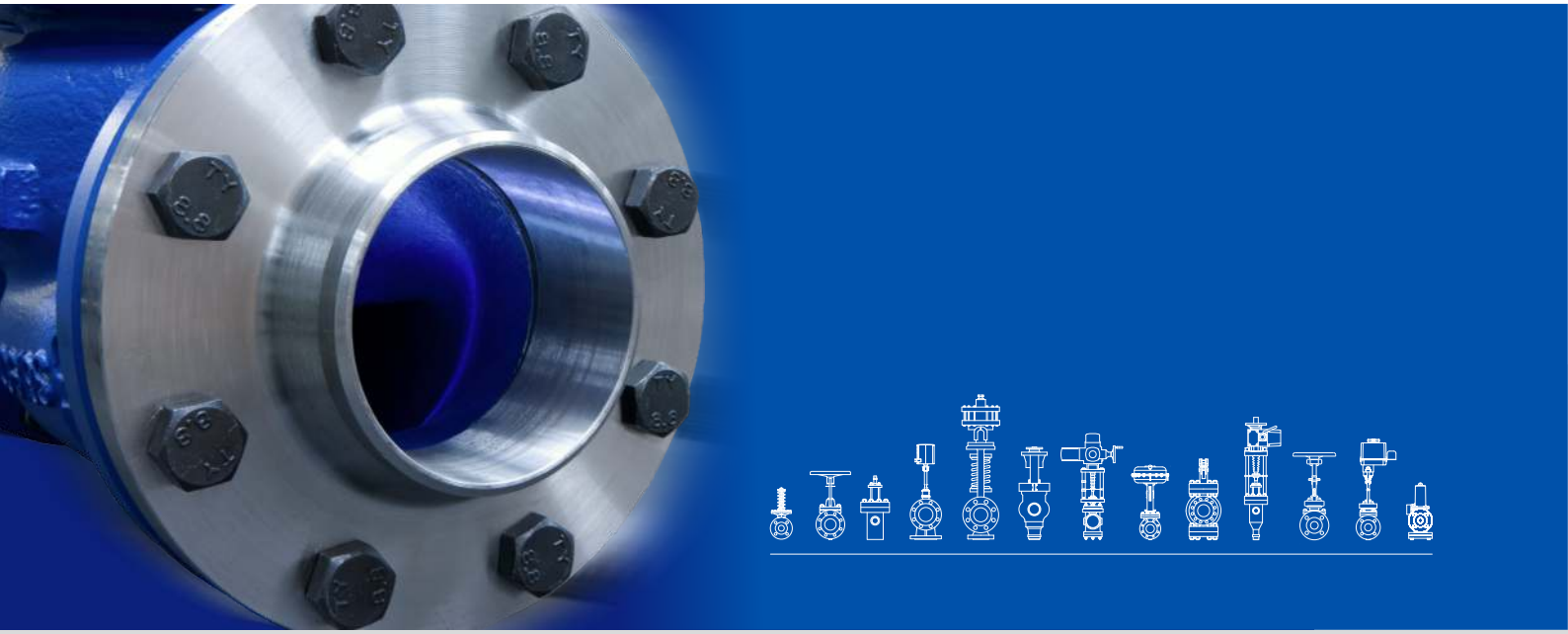

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