LDM, spol. s r.o. Czech Republic	INSTRUCTION FOR INSTALLATION AND SERVICE STEAM ATOMIZING INJECTION HEAD	VHP PM - 057/18/02/GB

The instructions for installation and service of steam atomizing injection head (VHP) are binding for users to ensure proper function of VHP. The user must keep the rules said here while servicing, installation and using.

1. TECHNICAL DESCRIPTION AND VALVE FUNCTION

1.1 Description

The VHP is device designed to control temperature of steam (steam desuperheater). VHP is equipped by Laval's nozzle, in which the injected cooling water is atomized by kinetic energy of steam. This arrangement ensure precise atomizing in broad range of water quantity. Quantity of cooling water is controlled by control valve, placed on the cooling water pipeline prior the VHP.
VHP is produced as flanged, flange 1 (connection to conditioned steam pipeline, reduction valve or other device) is always DN 80. Other dimensions (cooling water inlet DN/PN, steam inlet DN/PN, length B, C and L) are tailored according the customer's demand and must be specified in the order.

1.2 Aplication

VHP serves for accurate and efficient steam temperature control. It's designed specially for industrial applications, such as low-pressure steam production for central heating, steam circuits of powerplants or technological purposes.

1.3 Technical data

Series	**VHP**	
Desing	Steam atomizing injection head with Lava'ls nozzle	
Nominal diameter DN	Flange 1...80, flange 2 and 3 ...20, 25	
Nominal pressure PN	16 to 100	
Body material	Cast steel 1.0426	Alloy steel 1.7335
Material of pipe	Cast steel 1.0426	Alloy steel 1.7335
Nozzle material	1.7335 (15 320.6)	
Flanges mat. DN 20, 25, 80	1.0425	1.7335
Working temperatures	-20 to 400°C	-20 to 550°C
Mating dimensions (Flange 2, 3 / weld ends)	Acc. to ČSN EN 1092-1 / ČSN EN 12627 *1)	
Mating dimensions flange 1	Acc. to ČSN EN 1092-1	

*1) Dimensions and type of connection (flange / weld) acc. to cusomers requirements.
It shall be specified in the order.

1.4 Maximal permissible operating pressure acc. to EN 12516-1[MPa]

Material	PN	Temperature [°C]										
		100	150	200	250	300	350	400	450	500	550	600
Cast steel 1.0426	16	1,6	1,6	1,6	1,55	1,42	1,31	---	---	---	---	---
	25	2,5	2,5	2,5	2,42	2,22	2,04	---	---	---	---	---
	40	4,0	4,0	4,0	3,88	3,55	3,26	---	---	---	---	---
	63	6,3	6,3	6,3	6,11	5,59	5,14	---	---	---	---	---
	100	10,0	10,0	10,0	9,70	8,88	8,16	---	---	---	---	---
	160	16,0	16,0	16,0	15,5	14,2	13,0	---	---	---	---	---
	250	25,0	25,0	25,0	24,2	22,2	20,4	---	---	---	---	---
	320	32,0	32,0	32,0	31,0	28,4	26,1	---	---	---	---	---
	400	40,0	40,0	40,0	38,8	35,5	32,6	---	---	---	---	---
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	---

1.5. Proces media:

VHP was primary designed to atomize cooling water without any mechanical impurities (quality as boiler feeding water). As atomizing agent, the steam taken from pipeline prior reduction station is used. Application of VHP for other process media must be considered with regard to materials, used on parts which are in contact with media. It's recommended co consult such application with the VHP manufacturer.

II. DIRECTIIONS FOR INSTALLATION AND OPERATING OF STEAM INJECTION HEAD:

2.1. Preparation before installation:

The manufacturer delivers the VHP as assembled, adjusted and tested product. So, prior the installation the data on VHP ID plate should be compared with the data given in accompanying documentation and the VHP must be checked if it's complete and isn't damaged and dirty. Special attention should be paid to inner space and flange's sealing faces.

2.2. Installation VHP into pipeline:

The VHP must be installed into pipeline in such way, that flow of cooled medium is according to arrow on the flange 1. The VHP can be installed in any position.

For proper function of VHP, following instruction have to be obeyed:

-no excessive forces can be transferred form pipelines to VHP

-the pipelines (steam, cooling water, atomizing steam) must be cleaned from dirty and all strange particles must be removed prior the VHP installation, to prevent its serious damage.

-enough free space should be kept around the VHP for easy manipulation and maintenance. Minimum height is equal to distance between rounded end of the VHP body and lower edge of flange 1 (see dimension L on the sketch).

-installation itself must be done carefully and precisely by the experienced workers. The flange bolts should be tightened alternately to prevent additional forces and possible leakage.

In case, that the medium parameters don't lay in the given value range (speed in steam pipeline, amount of cooling water etc.) and thus the good atomizing can't be reached, so called "protection skirt" of steam pipeline is highly recommended. Call to manufacturer in case of doubts.

2.3. Troubleshooting:

2.3.1. Enormous increasing of noise:

Enormous increasing of noise can be caused by exceding of operating parameters mentioned on the name-plate or by presence of undesirable particle in injection system of injection head. It is necessary to check the state and consult it with producer.

2.3.2. VHP isn't able to control/cool the steam temperature to desired value:

This problem can be caused by cooling water or atomizing steam control valves. Their proper function should be tested. If the valves are in right condition, then the nozzle should be disassembled from VHP, and checked if isn't jammed or damaged.

2.4. Spare parts:

Spare parts are not a part of delivery. They must be ordered separately. For the ordering following data should be given: type code of VHP, production number and name and position of spare part (see Document B).

2.5. Guarantee conditions:

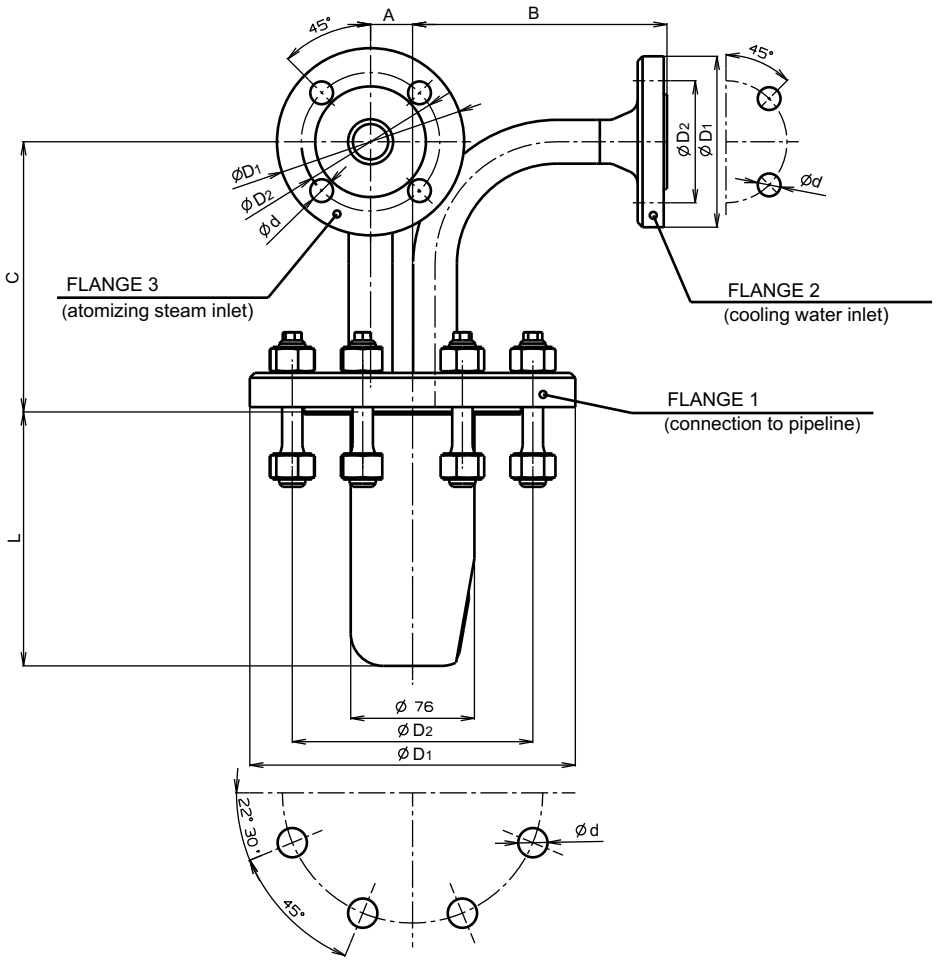
The producer does not guarantee the product operation and safety if the product was used in other way than stipulated in this instructions for installation and service and catalogue data sheet. Any use of the product under different conditions must be consulted with the producer.

The producer does not take over the guarantee if the user makes any change or modification to it without prior written consent from the producer.

2.6. Waste disposal:

Packaging material and the injection head shall be disposed of in the common way such as by handing over to a specialized enterprise for disposal of (body and metal parts - metal waste, other non-metal parts-communal waste).

Dimensional sketch:



Dimensions VHP:

Flange										A	B_{min}	C_{min}	L
1					2 and 3								
PN	DN	D_1	D_2	d	PN	DN	D_1	D_2	d				
		mm	mm	mm			mm	mm	mm	mm	mm	mm	mm
100	80	230	180	26	25	20	105	75	14	24	150 *)	150 *)	156
						25	115	85					
					40	20	105	75	14				
						25	115	85					
					63	20	130	90	18				
						25	140	100					
					100	20	130	90	18				
						25	140	100					

*1) Dimensions and type of connection (flange / weld) acc. to cusomers requirements. It shall be specified in the order.

Type code explanation VHP:

				XXX	XX		XX	/	XX	/	XX		XXX		
1. Series	Injection head			VHP											
2. Nozzle diameter	10				10										
3. Nominal diameter	Flange 1	DN 80	(connection flange - steam pipeline)				80								
	Flange 3	DN 20	(inlet of drive steam)						20						
		DN 25							25						
	Flange 2	DN 20	(inlet of cooling water)								20				
		DN 25									25				
5. Nominal pressure	PN 25												025		
	PN 40												040		
	PN 63												063		
	PN 100												100		
5. Body material	Cast steel 1.0425		(-20 to 400°C)												1
	Alloy steel 1.7335		(-20 to 550°C)												2

Ordering example : Injection head, flange 1 DN 80, flange 2 DN 25, flange 3 DN 20, PN 40, body material: cast steel 1.0425 is specified as follows : **VHP10 80/25/20-040 1**

ADDRESS OF FACTORY

LDM, spol. s r.o.
Litomyšlská 1378
560 02 Česká Třebová
Czech Republic

tel.: +420 465 502 511
fax: +420 465 533 101
E-mail: sale@ldm.cz
http://www.ldmvalves.com

REGIONAL OFFICES

LDM, spol. s r.o.
Office in Prague
Podolská 50
147 01 Praha 4
Czech Republic

tel.: +420 241087360
fax: +420 241087192
E-mail: tomas.suchanek@ldm.cz

LDM, spol. s r.o.
Office in Ústí nad Labem
Ladova 2548/38
400 11 Ústí nad Labem - Severní Terasa
Czech Republic

tel.: +420 602708257
E-mail: tomas.kriz@ldm.cz

SERVICE ORGANIZATION

LDM servis, spol. s r.o.
Litomyšlská 1378
560 02 Česká Třebová
Czech Republic

tel: +420 465502411-13
fax: +420 465531010
E-mail: servis@ldm.cz

LDM SUBSIDIARIES ABROAD

OOO "LDM Promarmatura"
Jubilejniy prospekt, dom.6a, of. 601
141407 Khimki
Moscow Region
Russia

tel.: +7 495 7772238
fax: +7 495 7772238
mobile: +7 9032254333
e-mail: inforus@ldmvalves.com

TOO “LDM”
Shakirova 33/1, kab. 103
100012 Karaganda
Kazachstan

tel.: +7 7212566936
fax: +7 7212566936
mobile: +7 7017383679
e-mail: sale@ldm.kz

LDM, Bratislava s.r.o.
Mierová 151
821 05 Bratislava
Slovakia

tel: +421 243415027-8
fax: +421 243415029
E-mail: ldm@ldm.sk
http://www.ldm.sk

LDM Armaturen GmbH
Wupperweg 21
D-51789 Lindlar
Deutschland

tel: +49 2266 440333
fax: +49 2266 440372
mobile: +49 1772960469
E-mail: ldmarmaturen@ldmvalves.com

LDM, Polska Sp. z o.o.
ul. Bednorza 1
40-384 Katowice
Polska

tel: +48 327305633
fax: +48 327305233
mobile: +48 601354999
E-mail: ldmpolska@ldm.cz

LDM Bulgaria Ltd.
z.k.Mladost 1
bl.42, floor 12, app.57
1784 Sofia
Bulgaria

tel: +359 2 9746311
fax: +359 2 8771344
mobile: +359 888925766
E-mail: ldm.bg@ldmvalves.com

www.ldmvalves.com