WOMA®
Water as a tool

Whirl Jet Nozzle 1000 bar

WSD - R

Operating pressure: max. 1000 bar

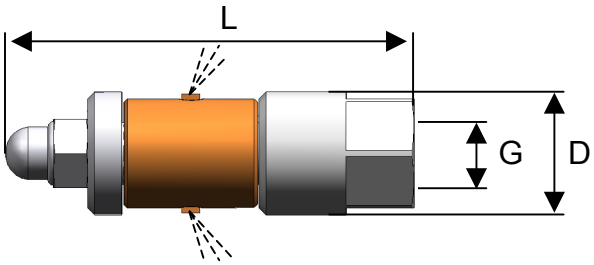
To use for: **Pipe cleaning**

Description:
The whirl jet nozzle “WSD – R” (radial water jet) is a rotating nozzle and is specially designed for the cleaning of inner walls of tubes. This nozzle guarantees an excellent cleaning rate. The different nozzle sizes allow an optimum adaptation to varying tube diameters.

Function:
By utilizing the reaction force of the high-pressure jet a nozzle carrier rotates on the longitudinal axis of a carrier shaft at several thousand rpm. The rotating radial jets will effectively clean inner walls of tubes from deposits or contamination.

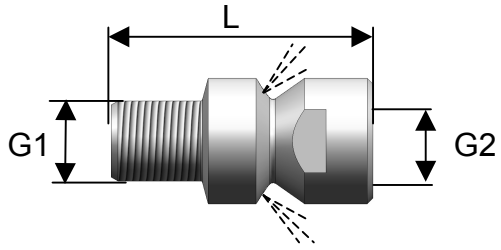
Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle
Radial water jets

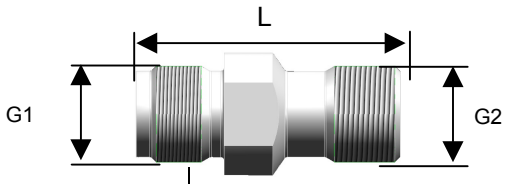


Type	Part-No.	Ø D mm	L mm	Thread G	Nozzle Ø mm	Spare sealing
R 10	341.0454	10	50	i M7	2x 0,8	280.1049
R 12	341.0232	12	55	i G 1/8	2x 0,8	280.0824
	341.0233				2x 1,0	
	341.0234				2x 1,2	
R 18	341.0540	18	55	i G 1/4	2x 0,7	280.0118
	341.0235				2x 0,8	
	341.0236				2x 0,9	
	341.0237				2x 1,0	
	341.0238				2x 1,2	
	341.0239				2x 1,5	
R 22	341.0538	22	55	i G 1/4	2x 0,7	
	341.0240				2x 1,2	
R 28	341.0532	28		i M 22x1,5	2x 1,0	280.0002
	341.0511				2x 1,1	
	341.0503				2x 1,4	
	341.0274				2x 1,5	
R 31	341.0291	31	90	i M 22x1,5	2x 1,0	
	341.0241				2x 1,2	
	341.0242				2x 2,2	
R 47	341.0243	47	100	i M22x1,5	2x 1,2	

Forward feed component

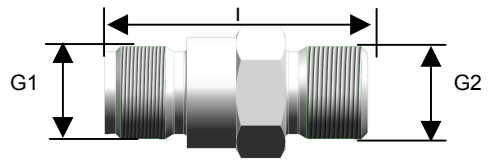


Type	Part-No.	Thread G1 – G2	Nozzle Ø mm	L mm
VSE 12	341.0251	a G 1/8 – i G 1/8	2x 0,8	47
	341.0252	a G 1/8 – i M 8x1	2x 0,8	47
VSE 18	341.0253	a G 1/4 – i G 1/4	2x 0,8	60
	341.0254	a G 1/4 – i M 10x1	2x 0,8	60
VSE 22	341.0255	a G 1/4 – i G 1/4	2x 0,9	60
	341.0256	a G 1/4 – i M 10x1	2x 0,9	60



VSE 31 / 47	341.0257	a M22x1,5 – a M22x1,5 60°DK	2x 0,9	60
	341.0259	a M22x1,5 – a M24x1,5 24°DK	2x 0,9	63

Hose Connector for R31 / R47



Part-No.	Thread G1 – G2	L mm
180.0001	M22x1,5 – M22x1,5 60°DK	61
180.0778	M22x1,5 – M24x1,5 24°DK	64,5

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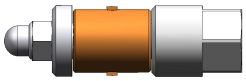
Water as a tool

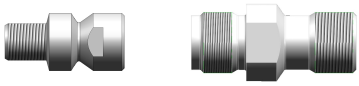
Performance Chart

Whirl jet nozzle WSD – R 1000



Type	Part-No.	Nozzle Ø mm	Operating pressure - bar - 300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
			Flow rate - l/min -														
R 10	341.0454	2x 0,8	10	11	11	12	13	13	14	15	15	16	16	17	17	18	18
R 12	341.0232	2x 0,8	10	11	11	12	13	13	14	15	15	16	16	17	17	18	18
	341.0233	2x 1,0	15	17	18	19	20	21	22	23	24	24	25	26	27	28	28
	341.0234	2x 1,2	22	24	26	27	29	30	32	33	34	35	36	37	39	40	41
R 18	341.0540	2x 0,7	10	10	11	12	12	13	14	14	15	15	16	16	17	17	18
	341.0235	2x 0,8	13	14	15	15	16	17	18	18	19	20	21	21	22	22	23
	341.0236	2x 0,9	16	17	18	19	21	22	22	23	24	25	26	27	28	28	29
	341.0237	2x 1,0	20	21	23	24	25	27	28	29	30	31	32	33	34	35	36
	341.0238	2x 1,2	28	31	33	35	36	38	40	42	43	45	46	48	49	50	52
	341.0239	2x 1,5	44	48	51	54	57	60	62	65	67	70	72	74	76	79	81
R22	341.0538	2x 0,7	10	11	12	12	13	14	14	15	16	16	17	17	18	18	19
	341.0240	2x 1,2	30	32	35	37	39	41	42	44	46	47	49	50	52	53	55
R 28	341.0532	2x 1,0	21	23	25	26	28	29	30	32	33	34	35	36	37	38	39
	341.0511	2x 1,1	26	28	30	32	34	35	37	38	40	41	42	44	45	46	47
	341.0503	2x 1,4	42	45	49	52	54	57	60	62	64	67	69	71	73	75	77
	341.0274	2x 1,5	48	52	56	59	62	65	68	71	74	76	79	81	84	86	88
R 31	341.0291	2x 1,0	21	23	25	26	28	29	30	32	33	34	35	36	37	38	39
	341.0241	2x 1,2	31	33	36	38	40	42	44	46	47	49	50	52	54	55	56
	341.0242	2x 2,2	104	112	120	127	134	141	147	153	159	164	170	175	180	185	190
R 47	341.0243	2x 1,2	32	34	36	39	41	43	45	46	48	50	52	53	55	56	58

Forward feed component VSE 1000



Typ	Nozzle Ø mm	Operating pressure - bar - 300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
		Flow rate - l/min -														
VSE 12	2x 0,8	13	14	15	16	17	18	19	20	20	21	22	22	23	24	25
VSE 18	2x 0,8	13	14	15	16	17	18	19	20	20	21	22	22	23	24	24
VSE 22	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
VSE 31	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
	4x 0,9	36	39	41	44	46	49	51	53	55	57	59	60	62	64	66
VSE 47	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
	4x 0,9	36	39	41	44	46	49	51	53	55	57	59	60	62	64	66

Thread M as per DIN 13 / ISO 261; Thread G as per DIN EN ISO 228-1

WOMA®
Water as a tool

Whirl Jet Nozzle 1000 bar

WSD – F / R

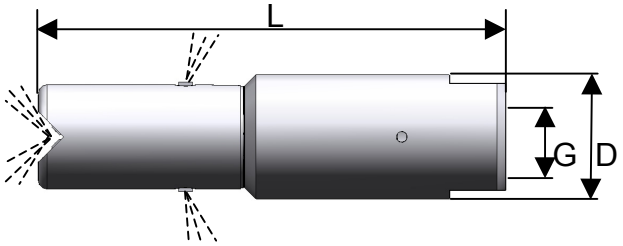
Operating pressure: **max. 1000 bar**
To use for: Pipe cleaning

Description:
The whirl jet nozzle “WSD – F/R“ (front- / radial water jet) is a rotating nozzle and is specially designed for the cleaning of inner walls of tubes and guarantees an excellent cleaning rate.
The different nozzle sizes allow an optimum adaptation to varying tube diameters.

Function:
By utilizing the reaction force of the high-pressure jet a nozzle carrier rotates on the longitudinal axis of a carrier shaft at several thousand rpm. The rotating radial jets will effectively clean inner walls of tubes from deposits or contamination.
The additional front jets cut the deposits/contamination out of the inner walls of the tubes.

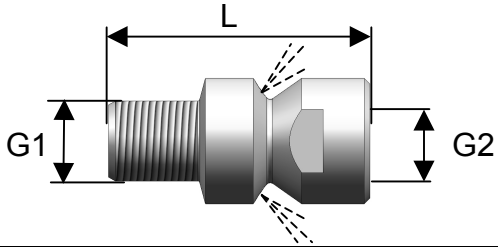
Special characteristics:
ATTENTION! Without forward feed components **the WSD-F/R may only be used with rigid lances – not with hoses**.
For the cleaning of vertically arranged tubes it is essential to clean from the bottom to the top.

Whirl jet nozzle
Front and **R**adial water jets

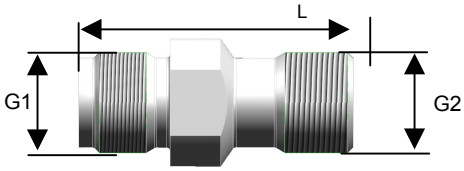


Type	Part-No.	Ø D mm	L mm	Thread G	Nozzle Ø mm	Spare sealing
F / R 12	341.0459	12	50	i G 1/8	2x 0,5F / 2x 0,5R	280.0824
	341.0244				2x 0,8F / 2x 0,8R	
	341.0530				2x 1,0F / 2x 1,0R	
F / R 18	341.0245	18	70	i G 1/4	2x 0,8F / 2x 0,8R	280.0118
F / R 22	341.0246	22	80	i G 1/4	2x 0,5F / 2x 0,5R	
	341.0386				2x 0,6F / 2x 0,6R	
	341.0247				2x 0,6F / 2x 0,8R	
	341.0531				2x 0,8F / 2x 0,8R	
	341.0248				2x 1,0F / 2x 1,0R	
F / R 31	341.0410	31	115	i M 22x1,5	2x 0,6F / 2x 0,6R	280.0002
	341.0489				2x 0,8F / 2x 0,8R	
	341.0249				2x 1,0F / 2x 1,0R	
F / R 47	341.0481	47	160	i M 22x1,5	2x 0,75F / 2x 0,8R	
	341.0250				2x 1,0F / 2x 1,0R	
	341.0293				2x 1,5F / 2x 1,5R	

Forward feed component

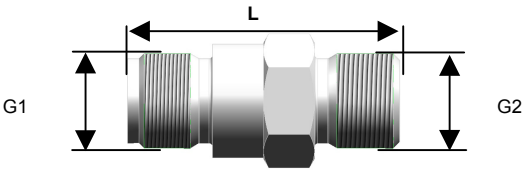


Type	Part-No.	Thread G1 – G2	Nozzle Ø mm	L mm
VSE 12	341.0251	a G 1/8 – i G 1/8	2x 0,8	47
VSE 18	341.0253	a G 1/4 – i G 1/4	2x 0,8	60
VSE 22	341.0255	a G 1/4 – i G 1/4	2x 0,9	60



VSE 31 / 47	341.0257	a M22x1,5 – a M22x1,5 60°DK	2x 0,9	60
	341.0443	a M22x1,5 – a M22x1,5 60°DK	4x 0,9	**60**
	341.0258	a M22x1,5 – a M22x1,5 24°DK	2x 0,9	**63**
	341.0259	a M22x1,5 – a M24x1,5 24°DK	2x 0,9	63

Hose connector for F/R31 + F/R47



Part-No.	Thread G1 – G2	L mm
180.0001	M22x1,5 – M22x1,5 60°DK	64
180.0778	M22x1,5 – M24x1,5 24°DK	64,5

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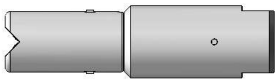
Water as a tool

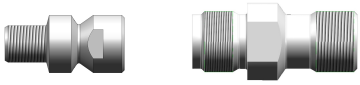
Performance Chart

Whirl Jet Nozzles WSD – F / R 1000



				Operating pressure - bar -													
Type	Part-No.	Nozzle Ø mm		350	400	450	500	550	600	650	700	750	800	850	900	950	1000
		Front	Radial	Flow rate - l/min -													
F/R12	341.0459	2x 0,5	2x0,5	8	8	9	9	19	10	11	11	11	12	12	12	13	13
	341.0244	2x 0,8	2x 0,8	20	21	22	24	25	26	27	28	29	30	31	32	33	33
	341.0530	2x 1,0	2x 1,0	31	33	35	37	39	40	42	44	45	47	48	50	51	52
F/R18	341.0245	2x 0,8	2x 0,8	26	28	30	31	33	34	36	37	38	40	41	42	43	44
F/R22	341.0246	2x 0,5	2x 0,5	11	12	12	13	14	14	15	16	16	17	17	18	18	19
	341.0386	2x 0,6	2x 0,6	16	17	18	19	20	21	22	22	23	14	25	25	26	27
	341.0247	2x 0,6	2x 0,8	22	23	25	26	28	29	30	31	32	33	34	35	36	37
	341.0531	2x 0,8	2x 0,8	28	30	32	34	35	37	38	40	41	42	44	45	46	47
	341.0248	2x 1,0	2x 1,0	44	47	50	52	55	57	60	62	64	66	68	70	72	74
F/R31	341.0410	2x 0,6	2x 0,6	17	18	19	20	21	22	23	24	24	25	26	27	28	28
	341.0489	2x 0,8	2x 0,8	30	32	34	35	37	39	40	42	43	45	46	48	49	50
	341.0249	2x 1,0	2x 1,0	46	50	53	55	58	61	63	66	68	70	72	74	76	78
F/R47	341.0481	2x0,75	2x 0,8	29	31	33	34	36	38	39	41	42	44	45	46	47	49
	341.0250	2x 1,0	2x 1,0	48	51	54	57	60	63	65	68	70	72	75	77	79	81
	341.0293	2x 1,5	2x 1,5	108	115	122	129	135	141	147	152	158	163	168	173	177	182

Forward feed components VSE 1000



		Operating pressure - bar -														
Type	Nozzle Ø mm	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
		Flow rate - l/min -														
VSE 12	2x 0,8	13	14	15	16	17	18	19	20	20	21	22	22	23	24	25
VSE 18	2x 0,8	13	14	15	16	17	18	19	20	20	21	22	22	23	24	24
VSE 22	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
VSE 31	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
	4x 0,9	36	39	41	44	46	49	51	53	55	57	59	60	62	64	66
VSE 47	2x 0,9	17	18	19	21	22	23	24	25	26	27	27	28	29	30	30
	4x 0,9	36	39	41	44	46	49	51	53	55	57	59	60	62	64	66

Thread M as per DIN 13 / DIN ISO 261; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

Whirl Jet Nozzles 1500 bar

WSD – R

Operating pressure: max. 1500 bar

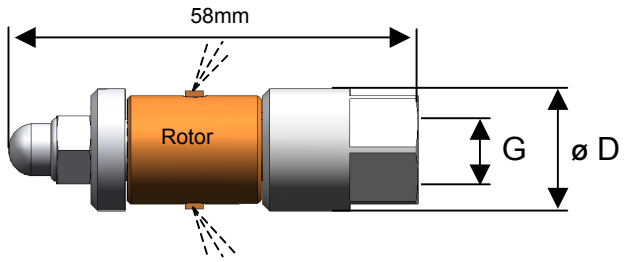
To use for: Pipe cleaning

Description:
The whirl jet nozzle “WSD – R” (radial water jet) is a rotating nozzle and is specially designed for the cleaning of inner walls of tubes. This nozzle guarantees an excellent cleaning rate. The different nozzle sizes allow an optimum adaptation to varying tube diameters.

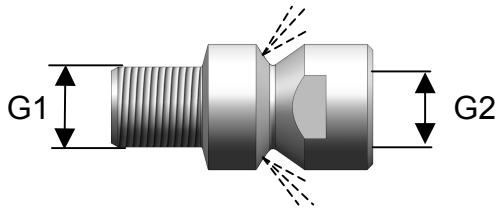
Function:
By utilizing the reaction force of the high-pressure jet a nozzle carrier rotates on the longitudinal axis of a carrier shaft at several thousand rpm. The rotating radial jets will effectively clean inner walls of tubes from deposits or contamination.

Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle
Radial water jets



Forward feed component



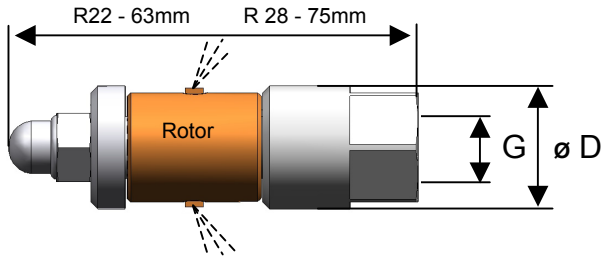
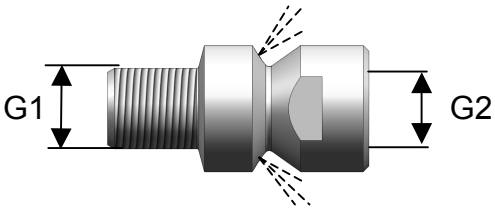
Type	Part-No.	Nozzle Ø mm	Ø D mm	Thread G	Spare rotor Part-No. / Nozzle Ø mm	Type	Part-No.	Thread G1 – G2	Nozzle Ø mm
R 15	341.0672	2x 0,6	15	i G 1/8	160.8568 / 2x0,6	**VSE 15**	341.0767	a G 1/8 – i G 1/8	2x 0,6
	341.0673	2x 0,7			160.8569 / 2x0,7		341.0768		2x 0,7
	341.0590	2x 0,8			160.8258 / 2x0,8		341.0645		2x 0,8
	341.0674	2x 0,9			160.8570 / 2x0,9				
	341.0591	2x 1,0			160.8323 / 2x1,0			Spare sealing	
	341.0675	2x 1,1			160.8571 / 2x1,1			Part-No.: 280.0824	
	341.0592	2x 1,2			160.8324 / 2x1,2				
	341.0676	2x 1,3			160.8572 / 2x1,3				
	341.0677	2x 1,4			160.8573 / 2x1,4				
	341.0678	2x 1,5			160.8574 / 2x1,5				
R 18	341.0679	2x 0,6	18	i G 1/4	160.8575 / 2x0,6	**VSE 18**	341.0769	a G 1/4 – i G 1/4	2x 0,6
	341.0593	2x 0,7			160.8259 / 2x0,7		341.0770		2x 0,7
	341.0594	2x 0,8			160.8325 / 2x0,8		341.0646		2x 0,8
	341.0595	2x 0,9			160.8326 / 2x0,9				
	341.0596	2x 1,0			160.8327 / 2x1,0			Spare sealing	
	341.0680	2x 1,1			160.8576 / 2x1,1			Part-No.: 280.0118	
	341.0597	2x 1,2			160.8328 / 2x1,2				
	341.0681	2x 1,3			160.8577 / 2x1,3				
	341.0682	2x 1,4			160.8578 / 2x1,4				
	341.0598	2x 1,5			160.8329 / 2x1,5				

Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle **R**adial water jets						**Forward feed component**			
									
Type	**Part-No.**	**Nozzle Ø mm**	**Ø D mm**	**Thread G**	**Spare rotor Part-No. / Nozzle Ø mm**	**Type**	**Part-No.**	**Thread G1 – G2**	**Nozzle Ø mm**
R 22	341.0683	2x 0,6	22	i G 1/4	160.8579 / 2x0,6	**VSE 22**	341.0771	a G 1/4 – i G 1/4	2x 0,7
	341.0599	2x 0,7			160.8260 / 2x0,7		341.0772		2x 0,8
	341.0600	2x 0,8			160.8330 / 2x0,8		341.0647		2x 0,9
	341.0684	2x 0,9			160.8580 / 2x0,9				
	341.0601	2x 1,0			160.8331 / 2x1,0			Spare sealing	
	341.0685	2x 1,1			160.8581 / 2x1,1			Part-No.: 280.0118	
	341.0602	2x 1,2			160.8332 / 2x1,2				
	341.0686	2x 1,3			160.8582 / 2x1,3				
	341.0687	2x 1,4			160.8583 / 2x1,4				
	341.0688	2x 1,5			160.8584 / 2x1,5				
R 28	341.0689	2x 0,6	28	i G 1/4	160.8585 / 2x0,6	**VSE 28**	341.0773	a G 1/4 – i G 1/4	2x 0,7
	341.0690	2x 0,7			160.8586 / 2x0,7		341.0774		2x 0,8
	341.0691	2x 0,8			160.8587 / 2x0,8		341.0648		2x 0,9
	341.0692	2x 0,9			160.8588 / 2x0,9				
	341.0624	2x 1,0			160.8261 / 2x1,0			Spare sealing	
	341.0693	2x 1,1			160.8589 / 2x1,1			Part-No.: 280.0118	
	341.0625	2x 1,2			160.8333 / 2x1,2				
	341.0694	2x 1,3			160.8590 / 2x1,3				
	341.0626	2x 1,4			160.8334 / 2x1,4				
	341.0695	2x 1,5			160.8591 / 2x1,5				

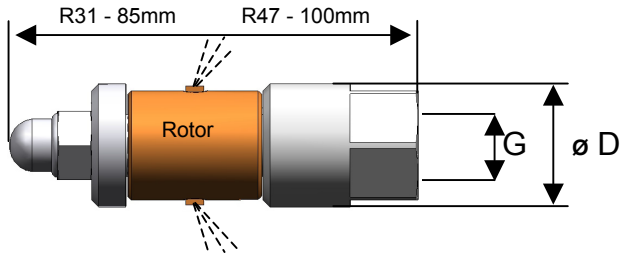
Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

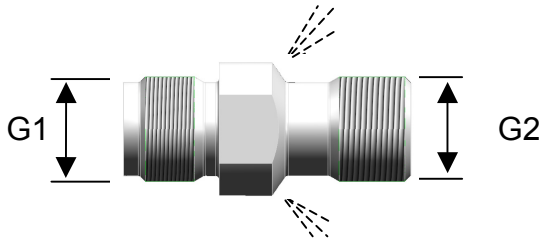
Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle
Radial water jets



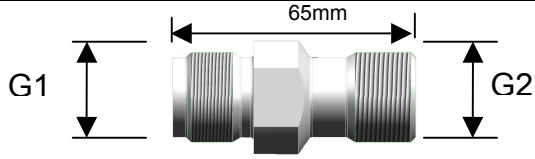
Type	Part-No.	Nozzle Ø mm	Ø D mm	Thread G	Spare rotor Part-No. / Nozzle Ø mm
R 31	341.0696	2x 0,6	31	i M22x1,5	160.8592 / 2x0,6
	341.0653	2x 0,7			160.8262 / 2x0,7
	341.0657	2x 0,8			160.8593 / 2x0,8
	341.0603	2x 0,9			160.8335 / 2x0,9
	341.0604	2x 1,0			160.8336 / 2x1,0
	341.0698	2x 1,1			160.8594 / 2x1,1
	341.0605	2x 1,2			160.8337 / 2x1,2
	341.0699	2x 1,3			160.8595 / 2x1,3
	341.0700	2x 1,4			160.8596 / 2x1,4
	341.0701	2x 1,5			160.8597 / 2x1,5
	341.0606	2x 2,2			160.8338 / 2x2,2
R 47	341.0702	2x 0,6	47	i M22x1,5	160.8598 / 2x0,6
	341.0654	2x 0,7			160.8263 / 2x0,7
	341.0703	2x 0,8			160.8599 / 2x0,8
	341.0704	2x 0,9			160.8600 / 2x0,9
	341.0705	2x 1,0			160.8601 / 2x1,0
	341.0706	2x 1,1			160.8602 / 2x1,1
	341.0607	2x 1,2			160.8339 / 2x1,2
	341.0707	2x 1,3			160.8603 / 2x1,3
	341.0708	2x 1,4			160.8604 / 2x1,4
	341.0709	2x 1,5			160.8605 / 2x1,5
	341.0608	2x 2,2			160.8340 / 2x2,2

Forward feed component



Type	Part-No.	Thread G1 – G2	Nozzle Ø mm
VSE 31/47	341.0775	a M22x1,5DZ-a M22x1,5 24°DK	2x 0,8
	341.0777	a M22x1,5DZ-a M24x1,5 24°DK	2x 0,8
	341.0649	a M22x1,5DZ-a M22x1,5 24°DK	2x 0,9
	341.0650	a M22x1,5DZ-a M24x1,5 24°DK	2x 0,9
	341.0776	a M22x1,5DZ-a M22x1,5 24°DK	2x 1,0
	341.0778	a M22x1,5DZ-a M24x1,5 24°DK	2x 1,0
		Spare sealing Part-No.: 280.0002	

Hose connector for R31/R47



	Part-No.	Thread G1 – G2
	180.1421	a M22x1,5DZ-a M22x1,5 24°DK
	180.0778	a M22x1,5DZ-a M24x1,5 24°DK

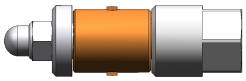
Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

Performance Chart

Whirl Jet Nozzles WSD – R



Type	Part-No.	Nozzle Ø mm	Operating pressure- bar -														
			800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
			Flow rate - l/min -														
R 15	341.0672	2x 0,6	10	10	11	11	11	12	12	12	12	13	13	13	13	13	14
	341.0673	2x 0,7	14	14	14	15	15	16	16	16	17	17	17	18	18	18	19
	341.0590	2x 0,8	18	18	19	19	20	20	21	21	22	22	23	23	24	24	24
	341.0674	2x 0,9	23	23	24	25	25	26	26	27	28	28	29	29	30	30	31
	341.0591	2x 1,0	28	29	30	30	31	32	33	33	34	35	36	36	37	37	38
	341.0675	2x 1,1	34	35	36	37	38	39	40	40	41	42	43	44	45	45	46
	341.0592	2x 1,2	40	41	43	44	45	46	47	48	49	50	51	52	53	54	55
	341.0676	2x 1,3	47	49	50	51	53	54	55	57	58	59	60	61	62	63	65
	341.0677	2x 1,4	55	56	58	60	61	63	64	66	67	68	70	71	72	74	75
	341.0678	2x 1,5	63	65	67	68	70	72	74	75	77	78	80	82	83	84	85
R 18	341.0679	2x 0,6	12	13	13	13	14	14	14	15	15	15	16	16	16	16	17
	341.0593	2x 0,7	17	17	18	18	19	19	19	20	20	21	21	22	22	22	23
	341.0594	2x 0,8	22	22	23	24	24	25	25	26	27	27	28	28	29	29	30
	341.0595	2x 0,9	27	28	29	30	31	31	32	33	34	34	35	36	36	37	38
	341.0596	2x 1,0	34	35	36	37	38	39	40	41	42	42	43	44	45	46	46
	341.0680	2x 1,1	41	42	44	45	46	47	48	49	50	51	52	53	54	55	56
	341.0597	2x 1,2	49	50	52	53	55	56	57	59	60	61	62	63	65	66	67
	341.0681	2x 1,3	57	59	61	62	64	66	67	69	70	72	73	74	76	77	79
	341.0682	2x 1,4	67	69	71	72	74	76	78	80	81	83	85	86	88	90	91
	341.0598	2x 1,5	76	79	81	83	85	87	90	92	94	95	97	99	101	103	105
R22	341.0683	2x 0,6	13	13	13	14	14	14	15	15	15	16	16	16	17	17	17
	341.0599	2x 0,7	17	18	18	19	19	20	20	21	21	21	22	22	23	23	24
	341.0600	2x 0,8	22	23	24	24	25	26	26	27	27	28	29	29	30	30	31
	341.0684	2x 0,9	28	29	30	31	32	33	33	34	35	35	36	37	38	38	39
	341.0601	2x 1,0	35	36	37	38	39	40	41	42	43	44	45	46	46	47	48
	341.0685	2x 1,1	42	44	45	46	47	49	50	51	52	53	54	55	56	57	58
	341.0602	2x 1,2	50	52	54	55	56	58	59	61	62	63	64	66	67	68	69
	341.0686	2x 1,3	59	61	63	65	66	68	69	71	73	74	76	77	78	80	81
	341.0687	2x 1,4	69	71	73	75	77	79	81	82	84	86	88	89	91	93	94
	341.0688	2x 1,5	79	81	84	86	88	90	93	95	97	99	101	102	104	106	108
R 28	341.0689	2x 0,6	13	13	14	14	15	15	15	16	16	16	17	17	17	18	18
	341.0690	2x 0,7	18	18	19	19	20	20	21	21	22	22	23	23	23	24	24
	341.0691	2x 0,8	23	24	25	25	26	27	27	28	28	29	30	30	31	31	32
	341.0692	2x 0,9	29	30	31	32	33	34	34	35	36	37	37	38	39	39	40
	341.0624	2x 1,0	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
	341.0693	2x 1,1	44	45	46	48	49	50	51	53	54	55	56	57	58	59	60
	341.0625	2x 1,2	52	54	55	57	58	60	61	62	64	65	66	68	69	70	71
	341.0694	2x 1,3	61	63	65	67	68	70	72	73	75	76	78	79	81	82	84
	341.0626	2x 1,4	71	73	75	77	79	81	83	85	87	89	90	92	94	96	97
	341.0695	2x 1,5	81	84	86	89	91	93	95	98	100	102	104	106	108	110	112

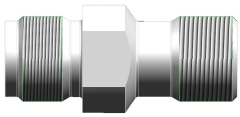
WOMA®

Water as a tool

Type	Part-No.	Nozzle Ø mm	Operating pressure - bar - 800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
			Flow rate - l/min -														
R 31	341.0696	2x 0,6	15	15	16	16	17	17	18	18	18	19	19	19	20	20	20
	341.0653	2x 0,7	20	21	22	23	23	24	24	25	25	26	26	27	27	28	28
	341.0697	2x 0,8	27	27	28	29	30	30	31	32	33	33	34	34	35	36	36
	341.0603	2x 0,9	34	35	36	37	38	38	39	40	41	42	43	44	44	45	46
	341.0604	2x 1,0	41	43	44	45	46	48	49	50	51	52	53	54	55	56	57
	341.0698	2x 1,1	50	52	53	55	56	57	59	60	61	63	64	65	66	68	69
	341.0605	2x 1,2	60	62	63	65	67	68	70	72	73	75	76	78	79	80	82
	341.0699	2x 1,3	70	72	74	76	78	80	82	84	86	88	89	91	93	94	96
	341.0700	2x 1,4	81	84	86	89	91	93	95	97	100	102	104	106	108	109	111
	341.0701	2x 1,5	93	96	99	102	104	107	109	112	114	117	119	121	123	126	128
	341.0606	2x 2,2	201	207	213	219	224	230	235	241	246	251	256	261	266	270	275
R 47	341.0702	2x 0,6	18	19	19	20	20	21	21	22	22	23	23	24	24	25	25
	341.0654	2x 0,7	25	26	26	27	28	29	29	30	31	31	32	32	33	34	34
	341.0703	2x 0,8	33	34	35	35	36	37	38	39	40	41	42	42	43	44	45
	341.0704	2x 0,9	41	43	44	45	46	47	48	49	50	52	53	54	55	56	56
	341.0705	2x 1,0	51	53	54	55	57	58	60	61	62	64	65	66	67	69	70
	341.0706	2x 1,1	62	64	65	67	69	71	72	74	75	77	79	80	81	83	84
	341.0607	2x 1,2	73	76	78	80	82	84	86	88	90	92	93	95	97	99	100
	341.0707	2x 1,3	86	89	91	94	96	99	101	103	105	108	110	112	114	116	118
	341.0708	2x 1,4	100	103	106	109	112	114	117	120	122	125	127	130	132	134	137
	341.0709	2x 1,5	115	118	121	125	128	131	134	137	140	143	146	149	151	154	157
	341.0608	2x 2,2	246	254	261	268	275	282	289	295	302	308	314	320	326	332	337

Performance Chart

Forward feed components VSE



Type	Part-No.	Nozzle Ø mm	Operating pressure - bar - 800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
			Flow rate - l/min -														
VSE 15	341.0767	2x 0,6	13	13	13	14	14	15	15	15	16	16	16	16	17	17	17
	341.0768	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0645	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 18	341.0769	2x 0,6	13	13	13	14	14	15	15	15	16	16	16	16	17	17	17
	341.0770	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0646	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 22	341.0771	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0772	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
	341.0647	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
VSE 28	341.0773	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0774	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
	341.0648	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
VSE 31/	341.0775	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 47	341.0649	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
M22x1,5	341.0776	2x 1,0	35	36	37	38	39	41	41	42	43	44	45	46	47	47	48
VSE 31/	341.0777	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 47	341.0650	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
M24x1,5	341.0778	2x 1,0	35	36	37	38	39	41	41	42	43	44	45	46	47	47	48

Änderungen vorbehalten!
Subject to change!

WOMA®

Water as a tool

Whirl Jet Nozzle

WSD – F / R

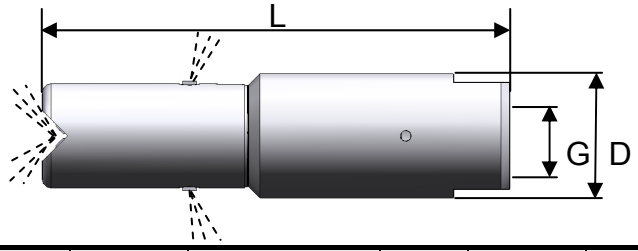
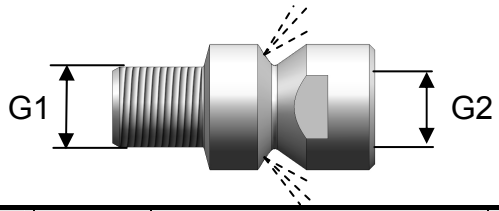
Operating pressure: max. 1500 bar

To use for: Pipe cleaning

Description:
The whirl jet nozzle “WSD – F/R“ (front- / radial water jet) is a rotating nozzle and is specially designed for the cleaning of inner walls of tubes and guarantees an excellent cleaning rate. The different nozzle sizes allow an optimum adaptation to varying tube diameters.

Function:
By utilizing the reaction force of the high-pressure jet a nozzle carrier rotates on the longitudinal axis of a carrier shaft at several thousand rpm. The rotating radial jets will effectively clean inner walls of tubes from deposits or contamination. The additional front jets cut the deposits/contamination out of the inner walls of the tubes.

Special characteristics:
ATTENTION! Without forward feed components **the WSD-F/R may only be used with rigid lances – <u>not</u> with hoses**. For the cleaning of vertically arranged tubes it is essential to clean from the bottom to the top.

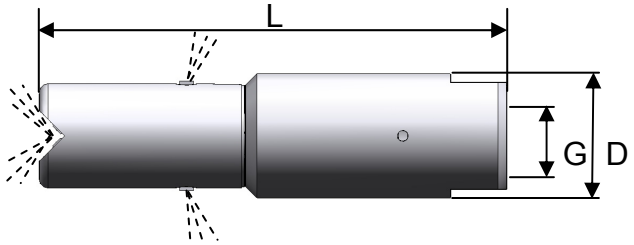
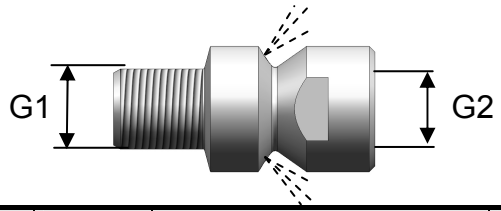
Whirl jet nozzle **F**ront and **R**adial water jets						**Forward feed component**			
									
Type	**Part-No.**	**Nozzle Ø mm**	**Ø D mm**	**Thread G**	**L mm**	**Type**	**Part-No.**	**Thread G1 – G2**	**Nozzle Ø mm**
F / R 15	341.0715	2x 0,5F / 2x 0,6R	15	i G 1/8	53	**VSE 15**	341.0767	a G 1/8 – i G 1/8	2x 0,6
	341.0716	2x 0,6F / 2x 0,6R					341.0768		2x 0,7
	341.0717	2x 0,6F / 2x 0,7R					341.0645		2x 0,8
	341.0609	2x 0,7F / 2x 0,7R							
	341.0718	2x 0,7F / 2x 0,8R						Spare sealing	
	341.0610	2x 0,8F / 2x 0,8R						Teile-Nr.: 280.0824	
	341.0719	2x 0,8F / 2x 0,9R							
	341.0720	2x 0,9F / 2x 0,9R							
	341.0721	2x 0,9F / 2x 1,0R							
	341.0722	2x 1,0F / 2x 1,0R							
F / R18	341.0723	2x 0,5F / 2x 0,5R	18	i G 1/4	73	**VSE 18**	341.0769	a G 1/4 – i G 1/4	2x 0,6
	341.0724	2x 0,5F / 2x 0,6R					341.0770		2x 0,7
	341.0725	2x 0,6F / 2x 0,6R					341.0646		2x 0,8
	341.0726	2x 0,6 F / 2x 0,7R							
	341.0611	2x 0,7F / 2x 0,7R						Spare sealing	
	341.0727	2x 0,7F / 2x 0,8R						Teile-Nr.: 280.0118	
	341.0612	2x 0,8F / 2x 0,8R							
	341.0728	2x 0,8F / 2x 0,9R							
	341.0729	2x 0,9F / 2x 0,9R							
	341.0730	2x 0,9F / 2x 1,0R							
	341.0731	2x 1,0F / 2x 1,0R							

Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

Special characteristics:
ATTENTION! Without forward feed components **the WSD-F/R may only be used with rigid lances – <u>not</u> with hoses**. For the cleaning of vertically arranged tubes it is essential to clean from the bottom to the top.

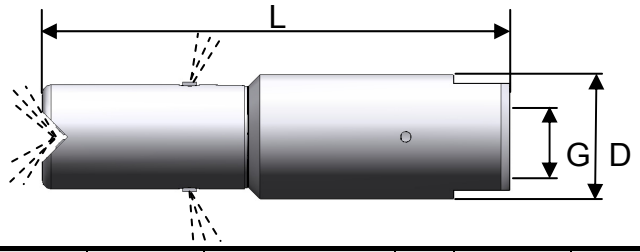
Whirl jet nozzle **F**ront and **R**adial water jets						**Forward feed component**			
									
Type	**Part-No.**	**Nozzle Ø mm**	**Ø D mm**	**Thread G**	**L mm**	**Type**	**Part-No.**	**Thread G1 – G2**	**Nozzle Ø mm**
F / R 22	341.0613	2x 0,5F / 2x 0,5R	22	i G 1/4	83	**VSE 22**	341.0771	a G 1/4 – i G 1/4	2x 0,7
	341.0732	2x 0,5F / 2x 0,6R					341.0772		2x 0,8
	341.0733	2x 0,6F / 2x 0,6R					341.0647		2x 0,9
	341.0734	2x 0,6F / 2x 0,7R							
	341.0735	2x 0,7F / 2x 0,7R						Spare sealing	
	341.0736	2x 0,7F / 2x 0,8R						Teile-Nr.: 280.0118	
	341.0737	2x 0,8F / 2x 0,8R							
	341.07387	2x 0,8F / 2x 0,9R							
	341.0739	2x 0,9F / 2x 0,9R							
	341.0740	2x 0,9F / 2x 1,0R							
	341.0615	2x 1,0F / 2x 1,0R							
F / R28	341.0741	2x 0,5F / 2x 0,5R	28	i G 1/4	93	**VSE 28**	341.0773	a G 1/4 – i G 1/4	2x 0,7
	341.0742	2x 0,5F / 2x 0,6R					341.0774		2x 0,8
	341.0743	2x 0,6F / 2x 0,6R					341.0648		2x 0,9
	341.0744	2x 0,6 F / 2x 0,7R							
	341.0623	2x 0,7F / 2x 0,7R						Spare sealing	
	341.0745	2x 0,7F / 2x 0,8R						Teile-Nr.: 280.0118	
	341.0746	2x 0,8F / 2x 0,8R							
	341.0747	2x 0,8F / 2x 0,9R							
	341.0748	2x 0,9F / 2x 0,9R							
	341.0749	2x 0,9F / 2x 1,0R							
	341.0750	2x 1,0F / 2x 1,0R							

Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®
Water as a tool

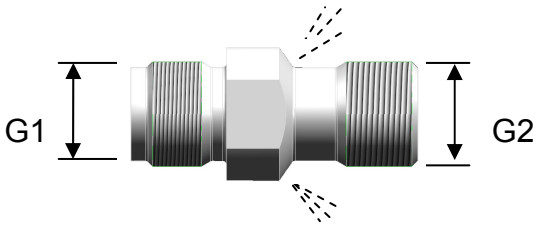
Special characteristics:
ATTENTION! Without forward feed components **the WSD-F/R may only be used with rigid lances – <u>not</u> with hoses**. For the cleaning of vertically arranged tubes it is essential to clean from the bottom to the top.

Whirl jet nozzle
Front and **R**adial water jets



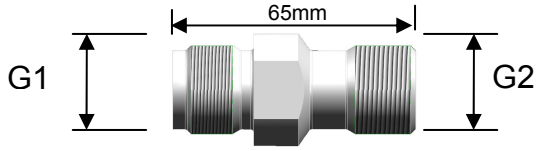
Type	Part-No.	Nozzle Ø mm	ØD mm	Thread G	L mm
F / R31	341.0616	2x 0,5F / 2x 0,5R	31	i M22x1,5	117
	341.0751	2x 0,5F / 2x 0,6R			
	341.0752	2x 0,6F / 2x 0,6R			
	341.0753	2x 0,6F / 2x 0,7R			
	341.0754	2x 0,7F / 2x 0,7R			
	341.0755	2x 0,7F / 2x 0,8R			
	341.0617	2x 0,8F / 2x 0,8R			
	341.0756	2x 0,8F / 2x 0,9R			
	341.0757	2x 0,9F / 2x 0,9R			
	341.0758	2x 0,9F / 2x 1,0R			
	341.0618	2x 1,0F / 2x 1,0R			
F / R47	341.0619	2x 0,5F / 2x 0,5R	47	i M22x1,5	164
	341.0759	2x 0,5F / 2x 0,6R			
	341.0760	2x 0,6F / 2x 0,6R			
	341.0761	2x 0,6F / 2x 0,7R			
	341.0762	2x 0,7F / 2x 0,7R			
	341.0763	2x 0,7F / 2x 0,8R			
	341.0620	2x 0,8F / 2x 0,8R			
	341.0764	2x 0,8F / 2x 0,9R			
	341.0765	2x 0,9F / 2x 0,9R			
	341.0766	2x 0,9F / 2x 1,0R			
	341.0621	2x 1,0F / 2x 1,0R			

Forward feed component



Type	Part-No.	Thread G1 – G2	Nozzle Ø mm
VSE 31/47	341.0775	a M22x1,5DZ-a M22x1,5 24°DK	2x 0,8
	341.0777	a M22x1,5DZ-a M24x1,5 24°DK	2x 0,8
	341.0649	a M22x1,5DZ-a M22x1,5 24°DK	2x 0,9
	341.0650	a M22x1,5DZ-a M24x1,5 24°DK	2x 0,9
	341.0776	a M22x1,5DZ-a M22x1,5 24°DK	2x 1,0
	341.0778	a M22x1,5DZ-a M24x1,5 24°DK	2x 1,0
		Spare sealing Teile-Nr.: 280.0002	

Hose connector for F/R 31+F/R47



	Part-No.	Thread G1 – G2
	180.1421	a M22x1,5DZ-a M22x1,5 24°DK
	180.0778	a M22x1,5DZ-a M24x1,5 24°DK

Thread M as per DIN 13 / DIN ISO 261 ; Thread G as per DIN EN ISO 228-1

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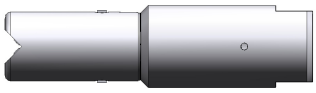
Water as a tool

Performance Chart

Whirl Jet Nozzles WSD – F / R



Type	Part-No.	Nozzle Ø mm		Operating pressure - bar -													
		Front	Radial	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
				Flow rate - l/min -													
F/R15	341.0715	2x 0,5	2x 0,6	19	19	20	20	21	21	22	22	23	23	23	24	24	25
	341.0716	2x 0,6	2x 0,6	21	22	22	23	24	24	25	25	26	26	27	27	28	28
	341.0717	2x 0,6	2x 0,7	26	27	27	28	29	29	30	31	31	32	33	33	34	34
	341.0609	2x 0,7	2x 0,7	29	30	31	31	32	33	34	34	35	36	36	37	38	38
	341.0718	2x 0,7	2x 0,8	34	35	36	37	38	39	40	41	41	42	43	44	45	45
	341.0610	2x 0,8	2x 0,8	38	39	40	41	42	43	44	45	46	47	48	49	49	50
	341.0719	2x 0,8	2x 0,9	44	45	46	47	49	50	51	52	53	54	55	56	57	58
	341.0720	2x 0,9	2x 0,9	48	49	51	52	53	54	56	57	58	59	60	61	62	64
	341.0721	2x 0,9	2x 1,0	54	56	58	59	61	62	63	65	66	67	69	70	71	72
	341.0722	2x 1,0	2x 1,0	59	61	62	64	66	67	69	70	72	73	74	76	77	78
F/R18	341.0723	2x 0,5	2x 0,5	17	18	18	19	19	20	20	21	21	21	22	22	23	23
	341.0724	2x 0,5	2x 0,6	21	22	23	23	24	24	25	25	26	26	27	27	28	28
	341.0725	2x 0,6	2x 0,6	25	26	26	27	28	28	29	30	30	31	31	32	33	33
	341.0726	2x 0,6	2x 0,7	30	31	31	32	33	34	35	35	36	37	37	38	39	40
	341.0611	2x 0,7	2x 0,7	34	35	36	37	38	39	39	40	41	42	43	43	44	45
	341.0727	2x 0,7	2x 0,8	39	41	42	43	44	45	46	47	48	49	50	51	52	52
	341.0612	2x 0,8	2x 0,8	44	46	47	48	49	50	51	53	54	55	56	57	58	59
	341.0728	2x 0,8	2x 0,9	51	52	54	55	56	58	59	60	61	63	64	65	66	67
	341.0729	2x 0,9	2x 0,9	56	58	59	61	62	64	65	67	68	69	71	72	73	74
	341.0730	2x 0,9	2x 1,0	63	65	67	68	70	72	73	75	77	78	80	81	82	84
	341.0731	2x 1,0	2x 1,0	69	71	73	75	77	79	80	82	84	86	87	89	90	92
F/R22	341.0613	2x 0,5	2x 0,5	19	20	20	21	21	22	22	23	23	24	24	25	24	26
	341.0732	2x 0,5	2x 0,6	24	25	25	26	27	27	28	28	29	30	30	31	31	32
	341.0733	2x 0,6	2x 0,6	28	29	29	30	31	32	32	33	34	34	35	36	36	37
	341.0734	2x 0,6	2x 0,7	33	34	35	36	37	38	39	40	40	41	42	43	43	44
	341.0735	2x 0,7	2x 0,7	38	39	40	41	42	43	44	45	46	47	48	48	49	50
	341.0736	2x 0,7	2x 0,8	44	45	47	48	49	50	51	52	53	55	56	57	58	59
	341.0737	2x 0,8	2x 0,8	49	51	52	53	55	56	57	59	60	61	62	63	64	65
	341.0738	2x 0,8	2x 0,9	57	58	60	61	63	64	66	67	69	70	71	73	74	75
	341.0739	2x 0,9	2x 0,9	62	64	66	68	69	71	72	74	76	77	79	80	81	83
	341.0740	2x 0,9	2x 1,0	70	72	74	76	78	80	82	84	85	87	89	90	92	94
	341.0615	2x 1,0	2x 1,0	77	79	81	83	86	88	89	91	93	95	97	99	100	102

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Water as a tool

Type	Part-No.	Nozzle Ø mm		Operating pressure - bar -													
				850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
		Front	Radial	Flow rate - l/min -													
F/R28	341.0741	2x 0,5	2x 0,5	20	20	21	21	22	22	23	23	24	24	25	25	26	26
	341.0742	2x 0,5	2x 0,6	25	25	26	27	27	28	29	29	30	30	31	32	32	33
	341.0743	2x 0,6	2x 0,6	28	29	30	31	32	32	33	34	34	35	36	36	37	38
	341.0744	2x 0,6	2x 0,7	34	35	36	37	38	39	40	41	41	42	43	44	45	45
	341.0623	2x 0,7	2x 0,7	39	40	41	42	43	44	45	46	47	48	49	50	50	51
	341.0736	2x 0,7	2x 0,8	45	47	48	49	50	52	53	54	55	56	57	58	59	60
	341.0737	2x 0,8	2x 0,8	50	52	53	55	56	57	59	60	61	62	64	65	66	67
	341.0738	2x 0,8	2x 0,9	58	60	61	63	65	66	68	69	70	72	73	75	76	77
	341.0739	2x 0,9	2x 0,9	64	66	68	69	71	73	74	76	77	79	81	82	83	85
	341.0740	2x 0,9	2x 1,0	72	74	77	79	80	82	84	86	88	90	91	93	95	96
	341.0615	2x 1,0	2x 1,0	79	81	83	86	88	90	92	94	96	98	99	101	103	105
F/R31	341.0616	2x 0,5	2x 0,5	23	24	25	25	26	27	27	28	28	29	29	30	30	31
	341.0751	2x 0,5	2x 0,6	30	30	31	32	33	34	34	35	36	37	37	38	39	39
	341.0752	2x 0,6	2x 0,6	34	35	35	36	37	38	39	40	41	42	42	43	44	45
	341.0753	2x 0,6	2x 0,7	41	42	43	44	46	47	48	49	50	51	52	53	54	54
	341.0754	2x 0,7	2x 0,7	46	47	48	50	51	52	53	54	55	57	58	59	60	61
	341.0755	2x 0,7	2x 0,8	54	56	57	59	60	62	63	64	66	67	68	70	71	72
	341.0617	2x 0,8	2x 0,8	60	61	63	65	66	68	69	71	72	74	75	77	78	79
	341.0756	2x 0,8	2x 0,9	69	71	73	75	77	79	81	82	84	86	87	89	91	92
	341.0757	2x 0,9	2x 0,9	76	78	80	82	84	86	88	90	92	93	95	97	99	100
	341.0758	2x 0,9	2x 1,0	86	89	91	94	96	98	100	103	105	107	109	111	113	115
	341.0618	2x 1,0	2x 1,0	93	96	99	101	104	106	108	111	113	115	118	120	122	124
F/R47	341.0619	2x 0,5	2x 0,5	26	26	27	28	29	29	30	30	31	32	32	33	33	34
	341.0759	2x 0,5	2x 0,6	33	34	35	36	36	37	38	39	40	41	41	42	43	44
	341.0760	2x 0,6	2x 0,6	37	38	39	40	41	42	43	44	45	46	47	47	48	49
	341.0761	2x 0,6	2x 0,7	45	47	48	49	50	52	53	54	55	56	57	58	59	60
	341.0762	2x 0,7	2x 0,7	50	52	53	55	56	57	58	60	61	62	63	65	66	67
	341.0763	2x 0,7	2x 0,8	60	62	63	65	67	68	70	71	73	74	76	77	78	80
	341.0620	2x 0,8	2x 0,8	66	68	69	71	73	75	76	78	80	81	83	84	86	87
	341.0764	2x 0,8	2x 0,9	77	79	81	83	85	87	89	91	93	95	97	99	100	102
	341.0765	2x 0,9	2x 0,9	83	86	88	90	92	95	97	99	101	103	105	107	109	110
	341.0766	2x 0,9	2x 1,0	96	98	101	104	106	109	111	113	116	118	120	123	125	127
	341.0621	2x 1,0	2x 1,0	103	106	108	111	114	117	119	122	124	127	129	132	134	136

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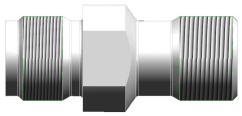
Water as a tool

Performance Chart

Forward Feed Components VSE



Type	Part-No.	Nozzle Ø mm	Operating pressure - bar -													
			800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
			Flow rate - l/min -														
VSE 15	341.0767	2x 0,6	13	13	13	14	14	15	15	15	16	16	16	16	17	17	17
	341.0768	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0645	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 18	341.0769	2x 0,6	13	13	13	14	14	15	15	15	16	16	16	16	17	17	17
	341.0770	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0646	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 22	341.0771	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0772	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
	341.0647	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
VSE 28	341.0773	2x 0,7	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24
	341.0774	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
	341.0648	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
VSE 31/	341.0775	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 47	341.0649	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
M22x1,5	341.0776	2x 1,0	35	36	37	38	39	41	41	42	43	44	45	46	47	47	48
VSE 31/	341.0777	2x 0,8	23	24	25	25	26	27	27	28	28	29	29	30	30	31	31
VSE 47	341.0650	2x 0,9	28	29	30	31	32	32	33	34	34	35	36	37	37	38	38
M24x1,5	341.0778	2x 1,0	35	36	37	38	39	41	41	42	43	44	45	46	47	47	48

WOMA®
Water as a tool

Whirl Jet Nozzles 2500 bar

WSD – R

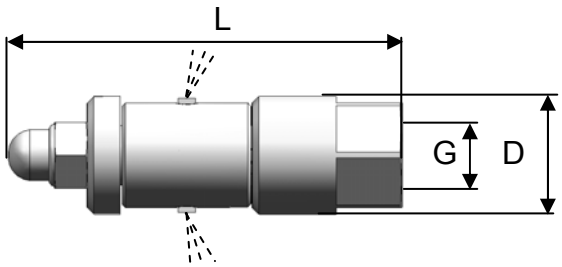
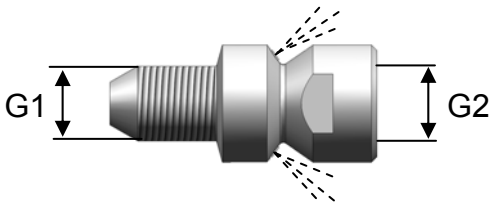
Operating pressure: max. 2500 bar

To use for: Pipe cleaning

Description:
The whirl jet nozzle “WSD – R” (radial water jet) is a rotating nozzle and is specially designed for the cleaning of inner walls of tubes. This nozzle guarantees an excellent cleaning rate. The different nozzle sizes allow an optimum adaptation to varying tube diameters.

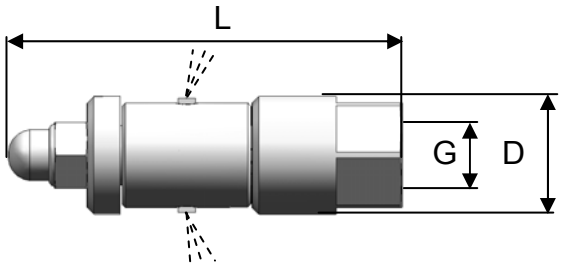
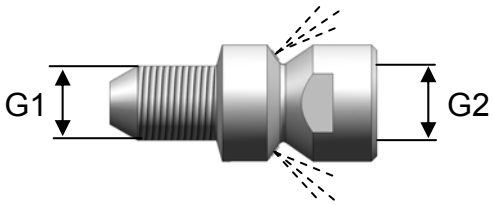
Function:
By utilizing the reaction force of the high-pressure jet a nozzle carrier rotates on the longitudinal axis of a carrier shaft at several thousand rpm. The rotating radial jets will effectively clean inner walls of tubes from deposits or contamination.

Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle Radial water jets						**Forward feed component**			
									
Type	**Part-No.**	**Ø D mm**	**L mm**	**Thread G**	**Nozzle Ø mm**	**Type**	**Part-No.**	**Thread G1 – G2**	**Nozzle Ø mm**
R 15	341.0781 341.0627 341.0628 341.0629 341.0630 341.0782 341.0783	15	58	i 3/8-24UNF-LH	2x 0,2 2x 0,3 2x 0,4 2x 0,5 2x 0,6 2x 0,7 2x 0,8	**VSE 15**	341.0793 341.0665 341.0794	a 3/8-24UNF-LH – i 3/8-24UNF-LH	2x 0,5 2x 0,6 2x 0,7
R 18	341.0784 341.0631 341.0632 341.0633 341.0634 341.0785 341.0786	18	58	i 3/8-24UNF-LH	2x 0,2 2x 0,3 2x 0,4 2x 0,5 2x 0,6 2x 0,7 2x 0,8	**VSE 18**	341.0795 341.0666 341.0796	a 3/8-24UNF-LH – i 3/8-24UNF-LH	2x 0,5 2x 0,6 2x 0,7

Thread M as per DIN 13 / ISO 261 ; Thread G as per DIN EN ISO 228-1

Special characteristics:
The WSD-R nozzle may be used with both – rigid lances **and** hoses without requirement of a forward feed component.

Whirl jet nozzle Radial water jets						**Forward feed component**			
									
Type	**Part-No.**	**Ø D mm**	**L mm**	**Thread G**	**Nozzle Ø mm**	**Type**	**Part-No.**	**Thread G1 – G2**	**Nozzle Ø mm**
R 22	341.0787 341.0635 341.0636 341.0655 341.0637 341.0638 341.0788 341.0789	22	63	i 9/16-18UNF-LH	2x 0,2 2x 0,3 2x 0,4 2x 0,45 2x 0,5 2x 0,6 2x 0,7 2x 0,8	**VSE 22**	341.0797 341.0667 341.0798	a 9/16-24UNF-LH – i 9/16-24UNF-LH	2x 0,5 2x 0,6 2x 0,7
R 28	341.0790 341.0639 341.0640 341.0641 341.0642 341.0791 341.0792	28	75	i 9/16-18UNF-LH	2x 0,2 2x 0,3 2x 0,4 2x 0,5 2x 0,6 2x 0,7 2x 0,8	**VSE 28**	341.0799 341.0668 341.0800	a 9/16-24UNF-LH – i 9/16-24UNF-LH	2x 0,5 2x 0,6 2x 0,7

Thread M as per DIN 13 / ISO 261 ; Thread G as per DIN EN ISO 228-1

WOMA®

Water as a tool

Performance Chart

Whirl jet nozzle WSD – R-2500

Type	Part-No.	Nozzle Ø mm	Operating pressure - bar - 1600	1700	1800	1900	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500
			Flow rate - l/min -														
R 15	341.0781	2x 0,2	11	12	12	13	14	14	15	15	16	16	16	17	17	18	19
	341.0627	2x 0,3	12	13	13	14	15	15	16	16	17	17	17	18	18	19	20
	341.0628	2x 0,4	14	15	15	16	17	17	18	18	19	19	19	20	20	21	21
	341.0629	2x 0,5	17	18	18	19	19	20	20	20	21	21	22	22	23	23	23
	341.0630	2x 0,6	19	20	20	21	21	22	22	22	23	23	23	24	24	24	25
	341.0782	2x 0,7	22	23	23	24	24	25	25	25	26	26	26	27	27	27	28
	341.0783	2x 0,8	26	27	27	28	28	29	29	29	30	30	30	31	31	31	32
R 18	341.0784	2x 0,2	12	13	13	14	15	15	16	16	17	17	17	18	18	19	20
	341.0631	2x 0,3	13	14	14	15	16	16	17	17	18	18	18	19	19	20	21
	341.0632	2x 0,4	15	16	16	17	18	18	19	19	19	20	21	22	22	23	23
	341.0633	2x 0,5	18	19	19	20	21	21	22	22	23	23	24	25	25	26	26
	341.0634	2x 0,6	22	23	24	25	26	27	28	28	29	29	30	30	31	31	32
	341.0785	2x 0,7	28	29	31	32	33	34	35	36	37	37	38	38	39	39	40
	341.0786	2x 0,8	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
R22	341.0787	2x 0,2	13	13	14	15	15	16	17	17	18	18	18	19	19	20	20
	341.0635	2x 0,3	14	14	15	16	16	17	18	18	19	19	20	20	20	21	21
	341.0636	2x 0,4	15	16	17	18	18	19	19	20	20	21	22	22	23	23	24
	341.0655	2x 0,45	16	17	18	19	20	20	21	22	22	22	23	24	24	25	26
	341.0637	2x 0,5	19	20	21	22	23	23	24	25	25	25	26	27	27	28	29
	341.0638	2x 0,6	23	24	25	26	27	28	29	29	30	30	31	31	32	32	33
	341.0788	2x 0,7	31	32	33	34	35	36	37	38	39	40	41	41	42	42	43
	341.0789	2x 0,8	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
R 28	341.0790	2x 0,2	14	14	15	16	16	17	18	18	19	19	20	20	20	21	21
	341.0639	2x 0,3	15	15	16	17	17	18	19	19	20	20	21	21	21	22	23
	341.0640	2x 0,4	17	17	18	19	19	21	22	22	23	23	24	24	25	25	26
	341.0641	2x 0,5	20	21	22	23	24	25	26	26	27	27	28	28	29	29	30
	341.0642	2x 0,6	24	25	26	27	28	29	30	30	31	31	32	32	33	33	34
	341.0791	2x 0,7	33	34	35	36	37	38	39	40	41	42	43	43	44	44	45
	341.0792	2x 0,8	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58

Forward feed component VSE-2500

Type	Part-No.	Nozzle Ø mm	Operating pressure - bar - 1600	1700	1800	1900	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500
			Flow rate - l/min -														
VSE 15	341.0793	2x 0,5	12	13	13	14	14	14	14	15	15	15	15	15	15	15	16
	341.0665	2x 0,6	18	19	19	20	20	21	21	21	21	22	22	22	22	23	23
	341.0794	2x 0,7	24	25	26	27	27	28	28	28	29	29	29	30	30	30	31
VSE 18	341.0795	2x 0,5	12	13	13	14	14	14	14	15	15	15	15	15	15	15	16
	341.0666	2x 0,6	18	19	19	20	20	21	21	21	21	22	22	22	22	23	23
	341.0796	2x 0,7	24	25	26	27	27	28	28	28	29	29	29	30	30	30	31
VSE 22	341.0797	2x 0,5	12	13	13	14	14	14	14	15	15	15	15	15	15	15	16
	341.0667	2x 0,6	18	19	19	20	20	21	21	21	21	22	22	22	22	23	23
	341.0798	2x 0,7	24	25	26	27	27	28	28	28	29	29	29	30	30	30	31
VSE 28	341.0799	2x 0,5	12	13	13	14	14	14	14	15	15	15	15	15	15	15	16
	341.0668	2x 0,6	18	19	19	20	20	21	21	21	21	22	22	22	22	23	23
	341.0800	2x 0,7	24	25	26	27	27	28	28	28	29	29	29	30	30	30	31