WELLAND & TUXHORN AG

ARMATUREN- UND MASCHINENFABRIK

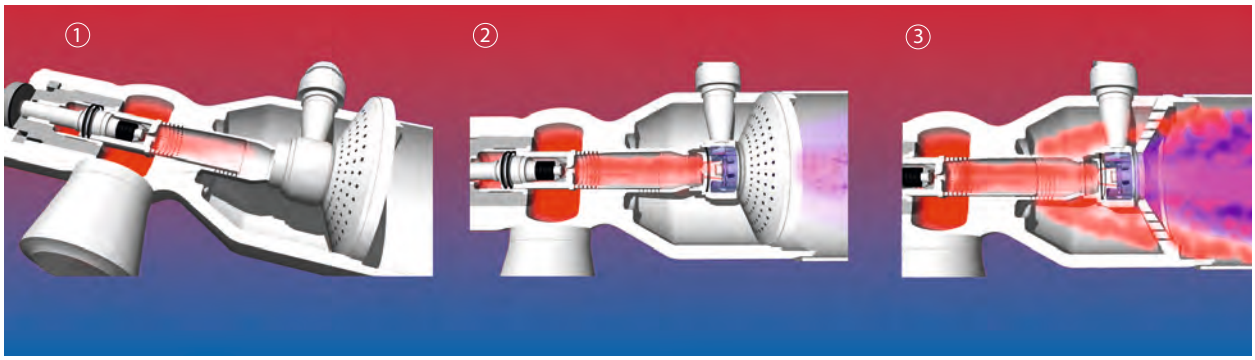
Steam converting valve Type DUV C4

for Power Stations and Industrial Plants

Type DUV-C4

Form Follows Function

Perfect Control and Reliable Operation.



DUV-C4

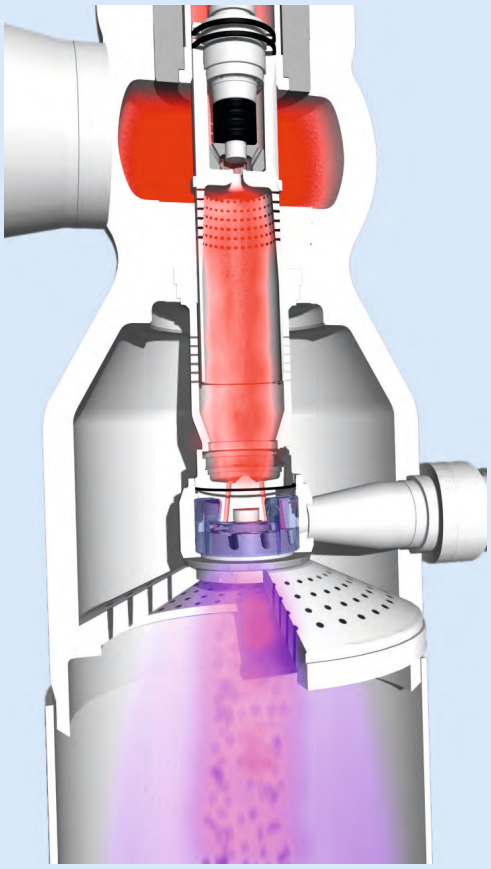
Steam inlet phase
1 When the perforated cage trim rises, steam enters the interior by passing through the holes of the 1st stage.

2 This special amount of steam is directed to the motive steam cooler. The integrated steam atomizer is supplied by motive steam via radial holes in the cooling water lance. Only when the required amount of motive steam is passed the 2nd stage will be released. After the motive steam passes through the atomizer, it will travel downstream- to the temperature sensor which will open the cooling water control valve. This insures that you always have atomizing steam before cooling water is injected.

Pressure reduction
3 As the perforated cylinder rises, theprecise holes of the trim are released inaccordance with the required opening characteristic. The unbored extension ofthe perforated cage trim will simultaneously release the holes of the throttle cylinder (the 2nd stage). The pressure or flow control is taken over by the perforated cage trim. With pressure reduction in at least two stages, steam that has not yet been cooled meets the thermal sensors installed some distance behind the valve outlet. Cooling water is requested and – regulated via the cooling water valve – enters the motive steam header. The kinetic energy of the motive steam that constantly flows there atomises the incoming cooling water.

Outlet phase
The cooling water will be atomised by the kinetic energy of the motive steam and the droplets will be spontaneously evaporated. Pressure reduction and desuperheating are complete. Depending on the pressure drop an extension with throttle discs can be fitted at the valve outlet to reduce the noise level and velocity of steam.

Technical Information



DUV-C4

KVS and CV values available*

KVS		30,5	52	85,5	112	161	252	374	464	560	830	995
CV		35,7	60,8	100	131	188	294,8	437,6	542,9	655,2	971,1	1164,1
Seat-Ø	r	55	65	80	90	110	135	160	185	210	250	300
Travel	r	40	50	60	75	90	100	120	150	160	200	200
Flow area	1st stage cm2	10,5	18	29,5	38,5	56,5	87	129	160	193	286	343
	in^2	1,63	2,79	4,6	5,97	8,6	13,48	19,99	24,8	29,92	44,33	53,17
	2nd stage cm2	18	32,5	52	68	97	152	225	279	337	500	600
	in^2	2,79	5,04	8,06	10,54	15,03	23,55	34,86	43,25	52,24	77,5	93

* Technical alteration reserved

Reference: Industrial area Höchst, Frankfurt

Highest Availability and Rangeability

- Universally applicable
- Optimum steam conversion over the whole load range through integrated motive steam cooler
- Optimum Water-Steam mixing in the shortest downstream distance
- Fast response even at partial load
- Low noise and vibration steam conversation through internals and downstream silencer
- All wearing parts can be replaced on site

	Inlet	Outlet
Nominal size	DN 80 to 500 / 3” to 20”	DN 200 to 1600 / 8” to 64”
Materials	WN 1.0460 / A 105 · WN 1.5415 · WN 1.7335 / A 182 F12 · (WN 1.7383 / A 182 F22) · (WN 1.4903 / A 182 F91) · (WN 1.4901 / A 182 F92)	
End connection	Welding ends in all versions	
min. pressure ratio1) p2/p1	< 0,5	
Nominal pressure	PN 16 to 630 Class 150 to 4500	PN 16 to 160 Class 150 to 1500
Seat-plug-seal	Metal sealing / leakage class IV DIN 12266-1P12 / leakage class V DIN / leakage class A	
Characteristic	20% equal percentage 80% linear	
Pressure reduction	Perforated cage trim provides controlled pressure reduction in two stages additionally with throttle cylinders and throttle cones	
Rangeability	1:50	
Seat and plug	WN 1.4122 / on request	
Stuffing box	WN 1.7383	
Guide bushing	Pure graphite	
Body gasket	serrated gasket / self-sealing cover	

* Technical alteration reserved

Variability

Actuator selection:
electric, hydraulic, pneumatic.

Safety First

Customized installation / operation instructions for highest availability.

A steam converting station is comprised of both the steam converting valve, and the associated cooling water control valve. The coordinated feed forward temperature design ofthese two components is critical to proper operation ofthe system.

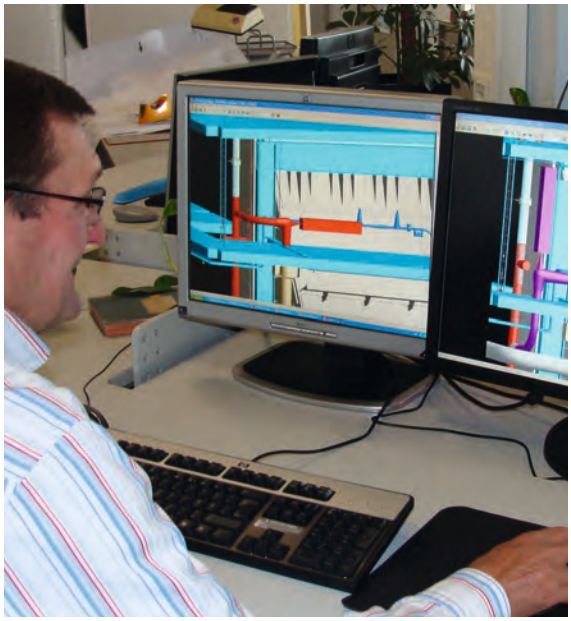
Steam pipings:
No normal bends or three-dimensional bends, immediately in front of or behind the valve.

- Guide values for straight lengths of pipe work are:
  - Upstream line approx. 5 dia.,minimum approx. 2 – 5 macc. to nominal size
  - Downstream line approx. 10 dia.,minimum approx. 3 – 5 macc. to nominal size
- The upstream line should have a slope against the direction of flow of approximately 100: 1 to 200: 1. A properly sized drain should be installed at the lowest point.
- Take care to avoid the possible accumulation of condensation as damage may occur to the pipe and valve from water hammer and erosion.

Warming-up and heating lines prevent the formation of condensation and reduce critical thermal stresses during start-up and shutdown. Remember that continuous operation produces little condensation, whereas frequent starting and stopping produces a great deal.

- Please follow the recommended start-up curves. Otherwise there is a risk of thermal stress. Longitudinal expansion should be brought about slowly.
- Arrangement of steam converting valve and cooling water control valve close together; the desuperheating cooling water control valve should be placed lower than the injection point of the steam converting valve.
- Vertical spindle for easy maintenance therefore shortened assembly time. Desuperheating water supply through symmetrically rising pipes. They ensure a continuous and constant supply of water to the injection point in the converting valve; in the case of operation shutdown, they prevent the cooling water pipes from draining. Drain line at the lowest point in the system.

Desuperheating water lines:
Desuperheating water lines have to be installed with enough flexibility to accommodate relative movement between the steam line system and the water line system. The thermo sensors have to be mounted into the straight downstream pipe, a min. of 5 - 8 m behind the valve, in horizontal exhaust steam pipes, in the 4 or 8 o'clock positions.



It is well-known that not all of these points can always be realized in practice. Shortage of available space frequently means that compromises must be made. Therefore contact our engineers in time to develop the best solution for your needs.

Contact us at

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THE AMERICAN SOCIETY
OF MECHANICAL ENGINEERS

Made In Germany

You will get a top product made by German valve specialists

Our Philosophy

As Westphalian traditional company for over 100 years we count on the values of this down-to-earth region: durability, reliability, and diligence. Thus, the development and production of Welland & Tuxhorn is governed by maximum precision, quality of workmanship and a high level of reliability.

Our Quality

The constantly high product quality is the result of a reasoned concept:We have implemented a multitude of quality assurance measures: Beginning with the continuous checking of drawings and manufacturing, followed by strict material inspections, surface crack detection, radiographic testing and ultrasonic testing, and ending with final pressure and tightness tests, supported by corresponding documentation. We fulfil all regulations according to DIN, EN, VdTÜV, AD-2000, TRD and also foreign regulations and standards as ASME, ANSI, IBR, and RTN. Our quality assurance system is approved according to the following regulations: DIN EN ISO 9001: 2000, Guide line 97/23 EG (PED), KTA 1401 und ASME. Our control valves have been tested and approved by all well-known acceptance authorities, such as TÜV, German Lloyd, Brit. Lloyd, Lloyd's Register of Shipping and Norske Veritas.

Our Service

After delivery, an experienced team of service engineers will be ready to provide assistance during the start-up period, or to carry out routine inspections. Since our overhauling department is integrated in the manufacturing department, these findings will be incorporated into new design innovations.

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