

STRAIGHT WAY PRESSURE REDUCING AND DESUPERHEATING STATIONS 1-5900 SERIES

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DESCRIPTION

Parcol 1-5900 Pressure Reducing and Desuperheating stations (PRDS) represent the most universal and compact solution for steam conditioning (pressure reduction and desuperheating) for general industrial application and for turbine by-pass, discharging both to intermediate or low pressure sections of power stations, when line straight valve layout is required.

The cast body design with low and uniform thickness, together with the high quality of construction materials, allows to maximize P/T fatigue resistance.

All Parcol desuperheating stations can be checked according to TRD 301 methodology and are suitable for not less than 2 000 cold start-up and 10 000 hot start-up cycles.

The pressure reduction is mainly achieved through two stages: the first stage has the function to adjust the flow rate by means of a drilled cage trim, the second stage, designed with fixed throttling section, has the double function to generate a backpressure on the first stage by reducing fluid velocity and generated sound pressure level, and to convey the steam towards the injection chamber, at speed and distribution suitable to optimize the desuperheating process.

The first pressure reduction stage usually consists on a VeGA 1-6940, straight way valve, with all available configurations of the VeGA series, included the free expanding, quick change trim up to maximum allowed working temperatures.

The second stage has also an absorbing function, acting as silencer towards the noise generated by the first stage. Such a function is remarkable in multi-cage figures, where the clearance between silencers is optimized to reduce noise frequencies between 1 kHz to 4 kHz, or when a Limphon disk stack is installed as a silencer.

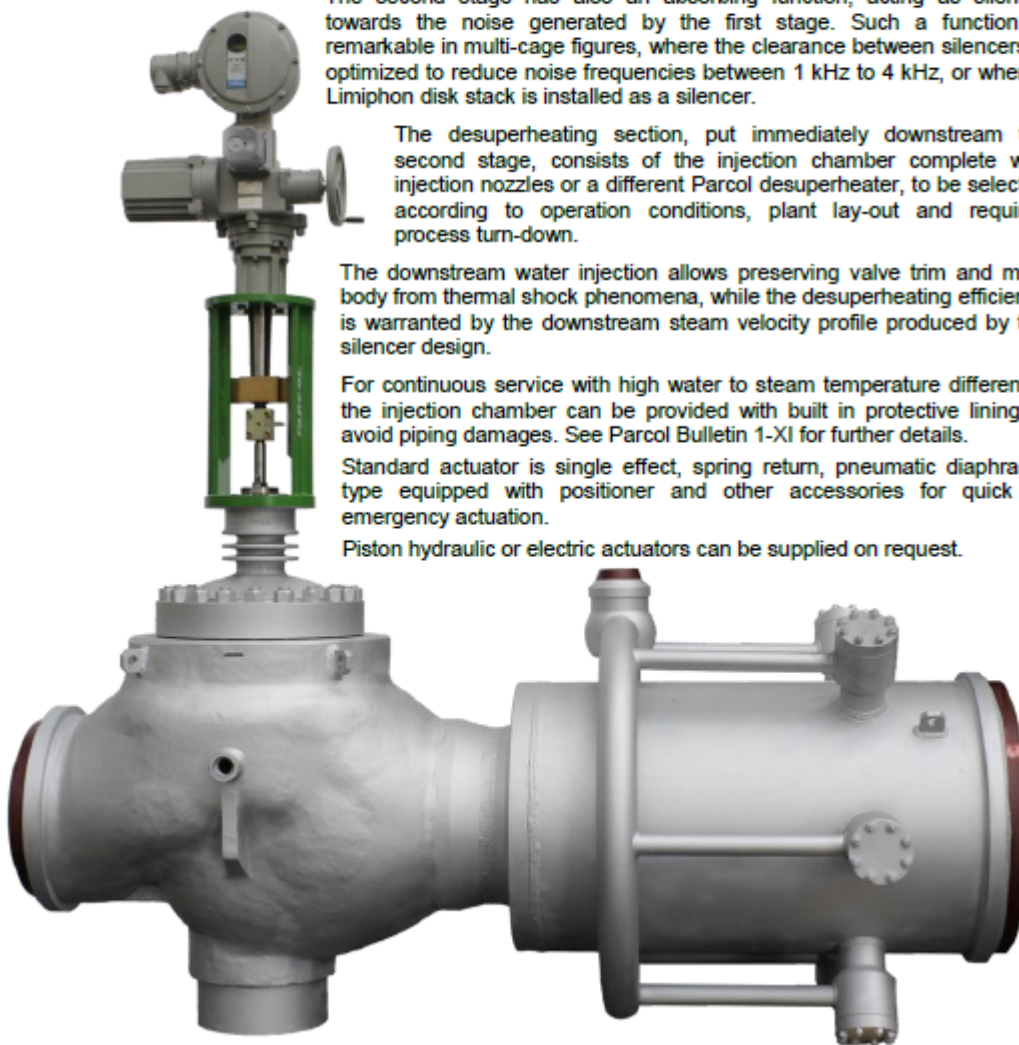
The desuperheating section, put immediately downstream the second stage, consists of the injection chamber complete with injection nozzles or a different Parcol desuperheater, to be selected according to operation conditions, plant lay-out and required process turn-down.

The downstream water injection allows preserving valve trim and main body from thermal shock phenomena, while the desuperheating efficiency is warranted by the downstream steam velocity profile produced by the silencer design.

For continuous service with high water to steam temperature differential the injection chamber can be provided with built in protective lining to avoid piping damages. See Parcol Bulletin 1-XI for further details.

Standard actuator is single effect, spring return, pneumatic diaphragm type equipped with positioner and other accessories for quick or emergency actuation.

Piston hydraulic or electric actuators can be supplied on request.



APPLICATIONS

Parcol 1-5900 are the best straight line body solution for steam conditioning, combining high performance flow control with high efficiency integrated steam desuperheating.

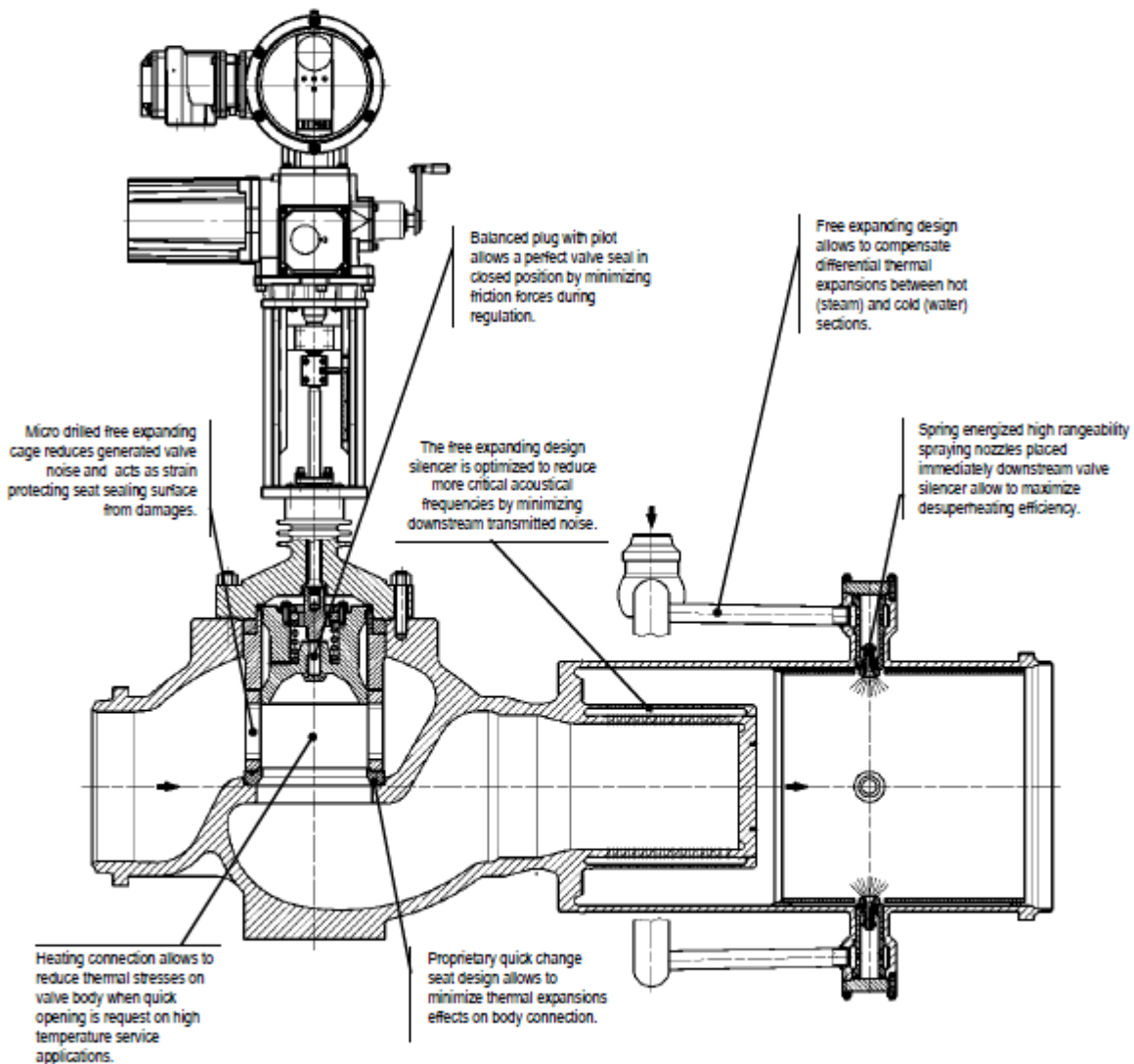
The most significant applications are steam conditioning stations for industrial applications and for medium and low pressure turbine by-pass systems.

The high experienced trim materials allow minimizing wear effects also for continuous services requiring minimum maintenance.

Thanks to the wide range of silencer solutions (including Limiphon disk stack silencer), any reasonably noise level requirement can be satisfied.





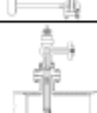

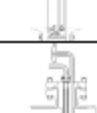

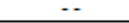





A wide range of Parcol desuperheaters can be installed allowing a proper steam conditioning also with high water to steam flow rates and high turndown ratio.

Parcol 1-5900 are particularly appreciated when straight line pipe layout is required.



NUMBERING SYSTEM

1 - 5 9 X X

| | | <i>DESUPERHEATER TYPE</i> | |
|---|---|---------------------------------|--|
| 0 | UNDEFINED | -- |  |
| 3 | LFP 3-4511 FIXED AREA NOZZLE | |  |
| 4 | LVP 3-4111 VARIABLE AREA NOZZLE | |  |
| 5 | LVM 3-4121 MULTIPLE NOZZLE | |  |
| 6 | SPRAYSAT 1-4442 MULTI NOZZLES | |  |
| 7 | SPRAYRING 1-4443 MULTI NOZZLES RING | |  |
| 8 | LVPA 3-4211 VARIABLE AREA STEAM ATOMIZED NOZZLE | |  |
| 9 | LVMA 3-4221 VARIABLE AREA STEAM ATOMIZED MULTI NOZZLES | |  |
| | | <i>DOWNSTREAM SILENCER TYPE</i> | |
| 0 | UNDEFINED | -- |  |
| 1 | WITHOUT SILENCER | |  |
| 4 | DISK OR DRILLED BASKET TYPE | |  |
| 6 | LIMIPHON DISK STACK | |  |
| 8 | DRILLED BASKET UNDER THE SEAT | |  |
| 9 | DRILLED BASKET UNDER THE SEAT + DISK OR DRILLED BASKET AT VALVE BODY OUTLET | |  |

DESIGN FEATURES

Body

- straight-way cast body according to 1-6940 series. Forged or laminated material for downstream silencer and water injection chamber fabricated by welding;
- available: sizes 4" to 24";
- ratings: up ANSI 1500 for DN 4" to 12", up to ANSI 600 from 14" to 24".
- See 1-6940 for more details.

Bonnet

- flanged, cast or forged depending on valve size and material.
- See 1-6940 for more details.

Trim

- cage-guided balanced with inserts or with plug with pilot according to leakage class required and maximum working temperature;
- first pressure reduction stage is performed by a specially drilled cage;
- quick change seat ring, with internal spring for high temperature service on large size valves;
- See 1-6940 for more details.

Silencer

- two different designs are available:
 - o 1 to 3 stages diffuser;
 - o LIMIPHON silencer.
- the silencer is usually welded to valve body.

Materials of construction

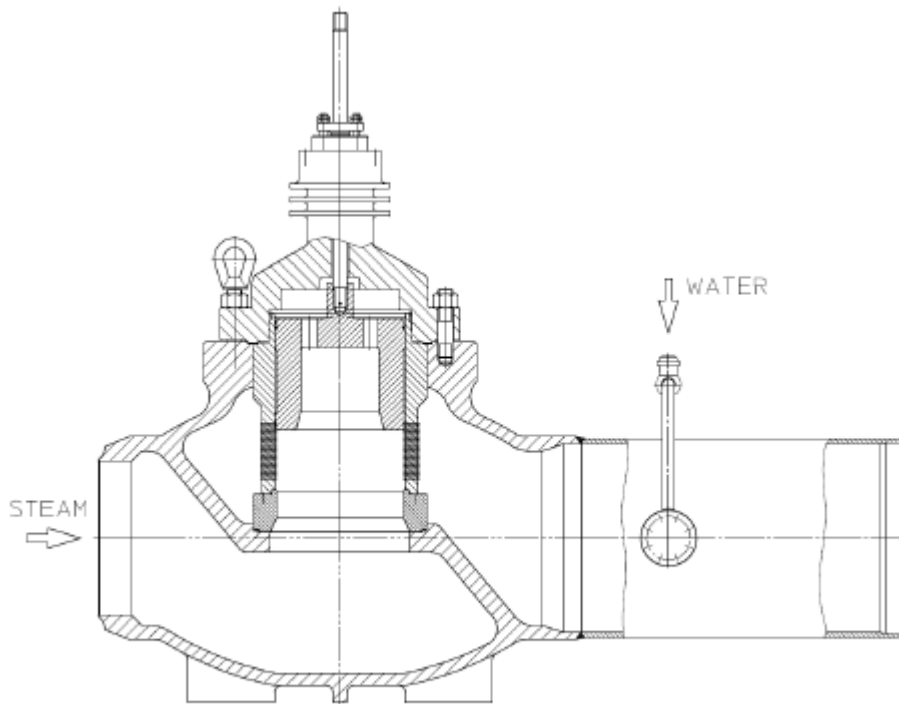
- carbon steel and CrMo alloy steels for pressure containing parts according to line class;
- trim parts are usually made of nitrided or stellite F6NM alloy steel;
- silencer is normally made of CrMo alloy steel, while LIMIPHON stack is normally made of AISI 430 or 12Cr special stainless steel for temperature above 400°C.
- See 1-6940 for more details.

Leakage class (according to IEC 60534-4)

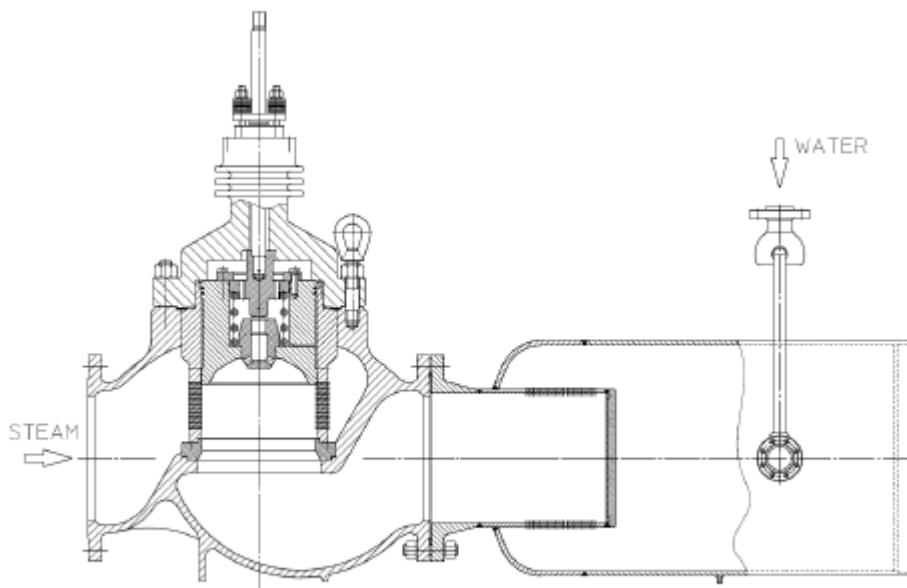
- up to class V both for balanced and unbalanced plug.

Packing

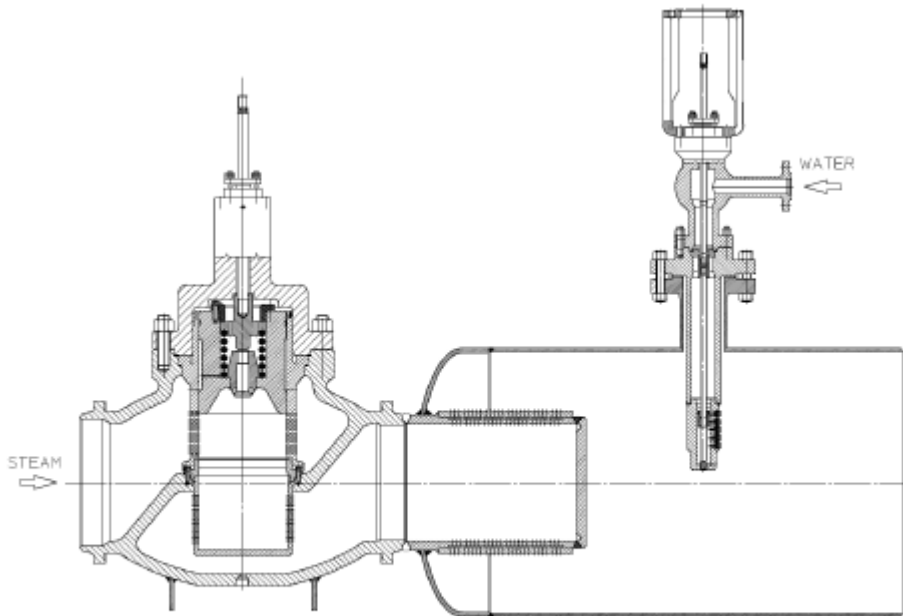
- Parcol GRF pure graphite packing specially designed for control application is supplied. Parcol GRF packing provides bi-directional tightness and it is therefore suitable also when vacuum seal is required.



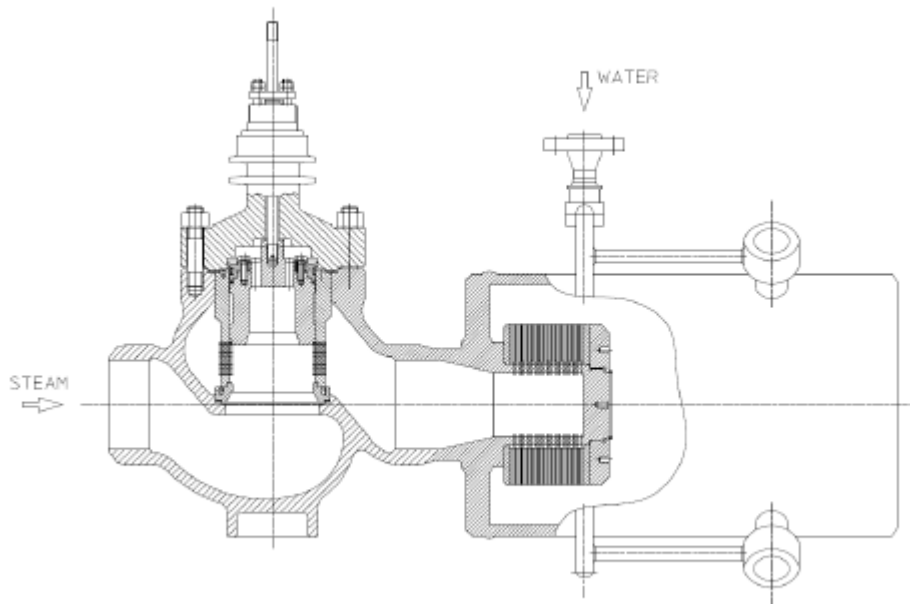
1-5915 flow-to-open – balanced plug – single cage quick-change trim – injection chamber with LVM multi-nozzle desuperheater without silencer.



1-5945 flow-to-close – balanced plug with pilot - tight shut-off – quick-change design – one stage silencer – injection chamber with LVM multi-nozzle desuperheater.



1-5996 flow-to-close - flow control by single cage – balanced plug with pilot - drilled basket under the seat - high temperature service and tight shut-off - two stages silencer (1st under the seat, 2nd at valve body outlet) – injection chamber provided with Spraysat.
 Typical application: HRH by-pass to condenser.



1-5965 series valve - flow-to-open - balanced plug - Limiphon outlet silencer - injection chamber provided with LVM spring nozzle type

