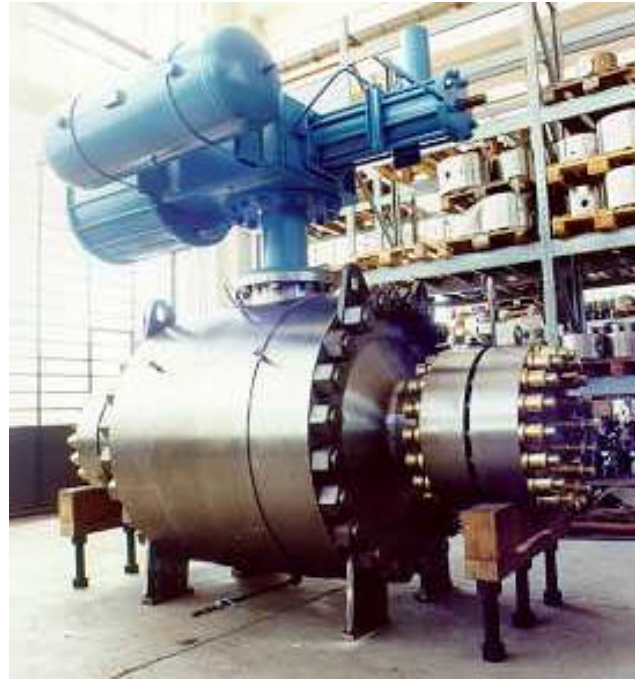


**Prefero™**



**TECHNICAL  
DOCUMENTATION**

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# 1. Standard Design Features.

## 1.1 Valve design capabilities

Perar's production range starts from sizes DN ¼" to 60" ANSI 150 - 300 - 600- 900 - 1500 - 2500 - 4500 / API 2000 - 3000 - 5000 - 10000 - 15000, Reduced Venturi and Full Bore, Floating and Trunnion mounted, split body, side entry, top entry, fully welded body, lever / gear operated or actuated with electric, pneumatic, hydraulic, gas hydraulic or other actuators.

High and low temperature, metal seated, cryogenic and sub-sea configurations are available.

Fire safe, NACE, API 6D, API 6A, ISO 9001.

Materials: Carbon steel. low temperature carbon steel, stainless steel, Duplex (ASTM A182 F51), Super Duplex (ASTM A182 F53), 6Mo (ASTM A182 F44), Monel K500 & K400, Inconel 625, Incoloy 825, Titanium, and many other special alloys, while Carbon Steel & Stainless Steel are part of our standard production range.

Furthermore, Perar is always available to study and engineer, together with their customer, new products according to the project requisitions, special applications and service conditions offering all our experience, plants, and test facilities.

We take this opportunity to draw your attention to Perar's standard design, which is in full accordance with API, ASME, ANSI and BS standards, as applicable. The API 6A design meets the product specification level 4, which is the highest quality level specified.

All Perar Ball Valves include the following technical features:

- Block & Bleed or upon request *Double Block & Bleed*.
- Anti blow out stem proof design.
- Anti-static device.
- Spring loaded seats.
- Soft or metal seated.
- Self relieving seats or upon request *Double Piston effect*.
- Flanged RF & RTJ, BW, c/w transition pieces (pups) or Hub ends.

Please see the relevant sketches in technical details section.

Perar's valves are field repairable. All ball and seats are interchangeable.

## 1.2 Stem Design.

The stem is independent from the ball and is a blow-out proof design.

The stem seals consist on a triple barrier of '**O**' Rings, located in the stem bushing.

Regardless of size and pressure rating the top 'O' Ring can be replaced with the valve installed on a pressurised line.

Please refer to Technical details.

### 1.3 Perar's low torque.

The torque is transmitted to the ball by a generously mating joint, therefore the stem is not affected by the side thrust.

Perar's valves are self lubricated by means of **DU Dry bearings** located in the upper and lower trunnion. This enable the valve to be operated with minimum friction and therefore with low torque. Allowing a smooth run during open/close operation, Perar's design contributes to a substantial cost saving in the selection/sizing of the actuator.

### 1.4 Actuation

Perar ball valves can be supplied complete with best and most renowned actuators in the world as:

- Electric: Rotork , Limitorque, Biffi, Ledeen, Auma, etc.
- Pneumatic and Hydraulic: Bettis, Biffi, Fluid System, Fahlke, Rotork, Camtorque, Shafer, etc...
- Subsea : Dantorque, Shafer, Danfoss, Biffi, etc.

---

## 2. Additional features

### 2.1 Double Piston Effect Seat.

Double Piston Effect seat system can be provided. The seat seal may be designed to provide additional sealing capability i.e. the cavity pressure is enhancing the contact pressure between seat and ball because of the differential areas which creates a piston effect, forcing the seats against the ball. In such a case it is recommended that a pressure **relief valve** be installed to protect the body cavity from excess pressure.

Please refer to attached sketches for a short explanation.

### 2.2 Emergency Sealant Injection System.

If required, an Emergency Sealant Injection System is available at the Stem and Seat areas. An Emergency Sealant Injection System through the seat up to the ball contact circle may provide temporary sealing until the time when it will be possible to restore the primary seal. A grease injector at the stem is also available. These systems are usually fitted for valves 6" and above, although specific applications on smaller valves are possible. Please refer to Technical details for sketches.-

### 2.3 Stem Extension.

Our customers require stem extensions for underground valves, or to operate a valve that is not easily accessible. Perar can provide any type of stem extension for manual, gear or actuated valves together with piping and fittings suitable to raise the body vent, the body drain, and the emergency sealant injection fittings to ground level.

### 2.4 Pups End

Butt welding ends valves may be supplied with transition pieces. Length of pups and matching details (i.e. pipe material and thickness) must be specified by the customer.

### 2.5 Hub Ends

For high pressure valves in offshore development Perar's customers are increasingly requiring special hub ends, which can save weight and material. Customer is to supply drawing/specification for hub machining.

### 2.6 Special Services & Special Features

- BDV, ESDV Valves
- Top entry Riser both in vertical and horizontal position
- Sea water services
- H2S Services
- Geothermal service
- Inconel 625, F316 overlay
- Internal Lining

## 3. Split Body Ball Valves

### 3.1 Brief Description

API spec 6D Ball Valves Trunnion supported ball, forged steel, 3 pieces split body side entry, metal to metal or soft seated sealing design self relieving spring loaded seats or double piston effect sealing system, anti-static device, anti-blow-out proof stem double block and bleed or block and bleed, venting and drain fittings, self lubricating stem and trunnion bearings to assure low operating torque throughout entire valve life, fire safe design to BS 6755 parts 2.

### 3.2 Perar's model:

EBV	8"x6"and above - Reduce Bore
EBF	6"and above - Full Bore
ECV	6"x4"and below - Reduce Bore
ECF	4"and below - Full Bore

### 3.3 Technical Details



#### Sizes:

From 1/2" up to 60"

#### Classes:

ANSI 150-300-600-900-1500-2500

API 2000-3000-5000-10000-15000

#### Materials:

Carbon Steel, Stainless Steel, 6Mo, Titanium, Duplex and Super Duplex Steels, Incoloy, Inconel, Special Alloys.

60" / 600# Split Body Ball Valves

## 4. Fully Welded Ball Valves

### 4.1 Brief Description

API spec 6D Ball Valves, Trunnion supported ball, forged steel, welded body construction, double piston seats sealing system, anti-static device, anti-blow out proof stem, block and bleed, venting and drain fittings, self lubricating stem and trunnion bearings to assure low operating torque throughout entire valve life, fire safe design to BS 6755 parts 2 or API 6FA or API 607. Emergency sealing system at stem and seats area, if required. Safety relieve valve in case of cavity over pressure (suggested only with Liquid Hydrocarbon).

### 4.2 Perar's model:

WBV	2"x1.1/2"and above - Reduce Bore
WBF	2"and above - Full Bore

### 4.3 Technical Details



#### Sizes:

From 1/2" up to 60"

#### Classes:

ANSI 150-300-600-900-1500-2500

API 2000-3000-5000-10000-15000

#### Materials:

Carbon Steel, Stainless Steel, 6Mo, Titanium, Duplex and Super Duplex Steels, Incoloy, Inconel, Special Alloys.

*Underground BW Ends*



## 5. Top Entry Ball Valves.

### 5.1 Brief Description

API spec 6D Ball Valves Trunnion supported ball, Top Entry design, cast body, bolted bonnet, metal to metal or soft seated sealing design, self relieving spring loaded seats or double piston effect sealing system, anti-static device, anti blow-out proof stem, double block and bleed or block and bleed , venting and drain fittings, self lubricating stem and trunnion bearings to assure low operating torque throughout entire valve life, fire safe design to BS 6755 parts 2

We would like to draw your attention to a recent supply (1998) to **Phillips Petroleum and Kerr McGee, UK**, through Kværner Oil & Gas. Some of these Top Entry valves are installed in vertical position, have been supplied with internal sleeves to allow the line to be flushed without damaging the valve seals while some of them are metal seated.

### 5.2 Perar's model:

TEV	8"x6"and above - Reduce Bore
TEF	6"and above - Full Bore
TDV	6"x4"and below - Reduce Bore
TDF	4"and below - Full Bore

### 5.3 Technical Details:



Sizes:

From 1/2" up to 60"

Classes:

ANSI 150-300-600-900-1500-2500

API 2000-3000-5000-10000-15000

Materials:

Carbon Steel, Stainless Steel, 6Mo, Titanium, Duplex and Super Duplex Steels, Incoloy, Inconel, Special Alloys.

*42" / 600# Top Entry Ball Valves*

## 6. Metal Seated Ball Valves

### 6.1 Brief Description

Where Perar has acquired a substantial experience in the last 10 years is in the enhancement of its Metal seated Ball valves range. This type of valves is becoming more and more common due to the challenges that our customers are facing exploring deeper wells, where fluids and gases are more commonly abrasive and with high content of solid particles (i.e. sand).

The performance of Perar valves, which are installed in *abrasive, slurry and high temperature* services has reached the astonishing target of assuring our customers bubble tight sealing. Perar test its metal seated valves in accordance to the most stringent procedures (i.e. BS 6755 leakage rate).

Perar has built an internal loop for testing metal seated valves, where high content of sand is injected into the system at high pressure. The valve c/w a pneumatic actuator is then operated for up to 1000 open/close cycles. This has brought a considerable amount of information to our Research & Development department that has been able to compare the different coating applied to the ball and seats.

The ball and the seat rings are hard-faced by using different coatings selected upon the service conditions i.e. Electroless Nickel Plating, Stellite hard-facing, Chromium Carbide, Tungsten Carbide.

Perar metal seated valves are available in different design: Top Entry, Split Body and Fully Welded. Please see the enclosed General Arrangement drawings c/w Bill of Material.

## 7. Sub-sea Ball Valves

### 7.1 Brief Description

Main design characteristics and attributes of Perar sub-sea ball valves are generally the same for topside valves, with additional features to withstand the external pressure.

Perar recommend fully welded body construction to prevent potential leakage from the body closure seals reducing the total seal area (and circumference), compared to the other designs.

Double piston sealing system, special heavy coating, sub-sea gearbox or c/w ROV adapter receptacle connections, complete this special execution if required.

However sub-sea ball valves can be supplied in accordance with any other project designs or requirements.

### 7.2 Technical Details



Sizes:

From 1/2" up to 60"

Classes:

ANSI 150-300-600-900-1500-2500

API 2000-3000-5000-10000-15000

Materials:

Low Temperature Carbon Steel, Stainless Steel, Special Alloys.

*42" / 300# Fully Welded execution*

## 8. Cryogenic Ball Valves

### 8.1 Brief Description

Perar's experience in valve manufacturing: Top Entry, Split Body and Fully Welded, ranges from Manual, Motor Operated, Emergency Shut Down, Blow Down, Riser, Metal seated, Cryogenic, Sub-sea in both horizontal & vertical line. Materials supplied are in accordance with ASTM standard: Carbon Steel, Stainless Steel and Special alloys such as Super Duplex, 6Mo, Inconel, Incoloy, Titanium are nowadays common practice at Perar's works.

Perar has specialised in Low Temperature and Cryogenic service to the extreme temperature of minus 196 Deg C, in accordance to the most stringent specifications.

Perar Ball Valves in cryogenic service are supplied with extended bonnet with a sufficient gas column length (vapour space) to keep the stem seals exposed only to vapour to ensure functional integrity and not the cold liquid. Suitable seals are selected considering the customer's process indication. PTFE lip seal spring energised or KEL-F material are commonly used.

A large number of valves of different design, size and pressure have been tested at Perar's facilities at various temperatures with Helium/Nitrogen mixture. Certification and procedures are available, duly stamped by different Third Party Authorities.

Body Material F316, F44, F XM-19, or others, KEL-F, PTFE/Elgiloy, PTFE/AISI 302 or other seats and seal materials.

### 8.2 Technical Details:



Sizes:

From 1/2" up to 60"

Classes:

ANSI 150-300-600-900-1500-2500

API 2000-3000-5000-10000-15000

Materials:

Low Temperature Carbon Steel,  
Stainless Steel

*6" / 900# Top Entry Ball Valves*

## 9. Floating Ball Valves

### 9.1 Brief Description:

Perar API Spec. 6D/BS 5351 Floating Ball Valves, ANSI B16.5 RF flanges ends, 2/3 pieces split body, forged steel body, side entry, anti-static device to BS 5351 anti-blow out proof stem, fire safe design to BS 6755 part 2, full or reduce bore, lever or gear operated

Perar Bare stock Floating Ball Valves, ANSI B.2.1 two pieces screwed body construction, side entry, class 600/800, 3000, 6000, anti-blow out stem, anti-static device, seat supported ball, NPT ends or socket weld ends according to ANSI B16.11, fire safe design, zinc plated body.

### 9.2 Perar's model:

FCV	Reduce Bore
FCF	Full Bore

### 9.3 Technical details:



#### Sizes / Classes:

From 1/2" up to 8" / 150#

From 1/2" up to 6" / 300#

From 1/2" up to 3" / 600#

From 1/2" up to 1.1/2" /900# to 2500#

#### Materials:

Carbon Steel, Stainless Steel

## 10. Technical details

Anti-static device and seals detail - Trunnion Ball Valve - ANSI 150# to 600#

Anti-static device and seals detail - Trunnion Ball Valve - ANSI 900# to 2500#

Block and Bleed System

Double Block and Bleed System

Emergency Sealant fittings

Stem Seal System details

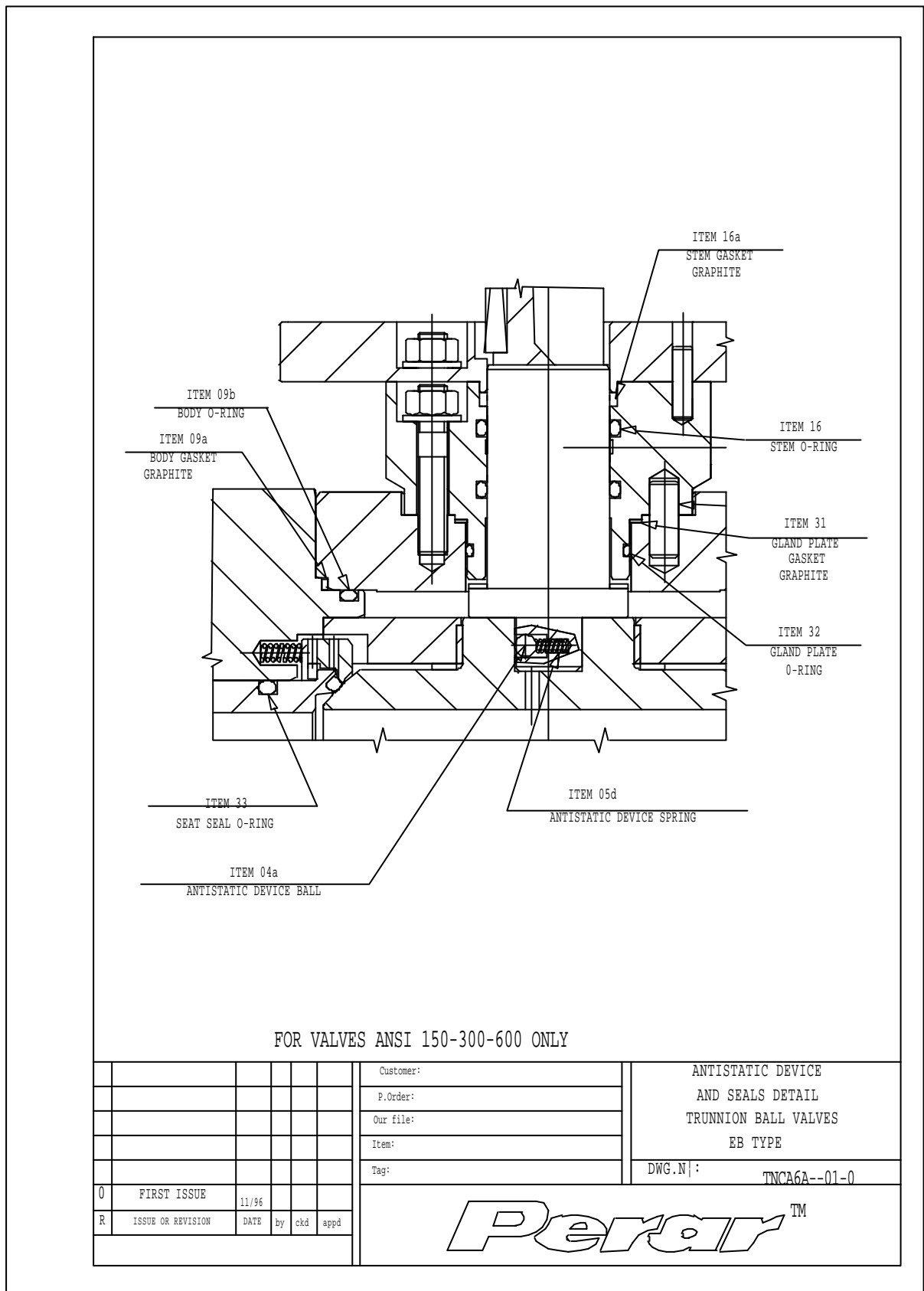
Seat Seal System details

Self Relieving System - EB, WB Type

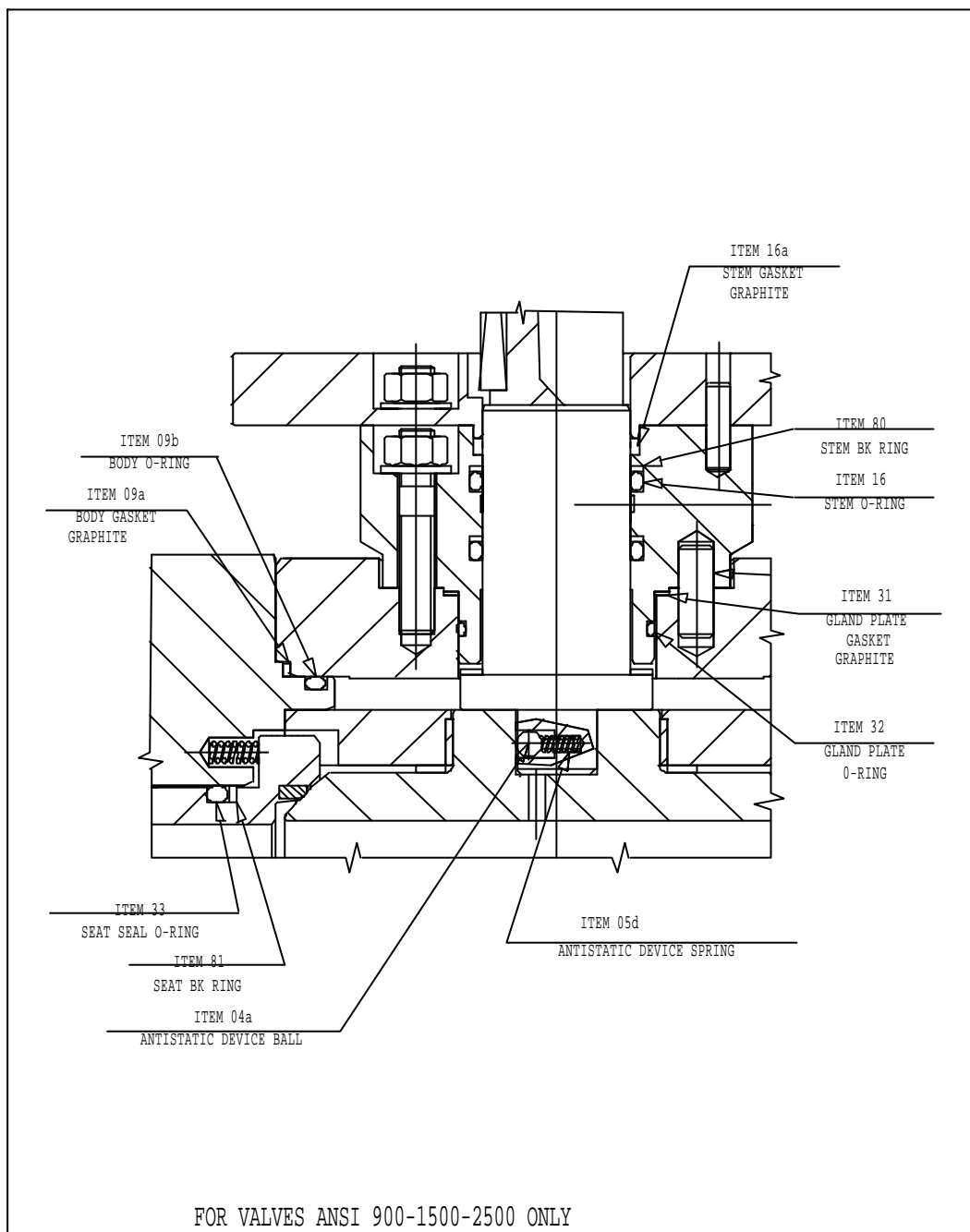
Double Piston Effect - EB, WB Type


Self Relieving System - TE Type

Double Piston Effect - TE Type



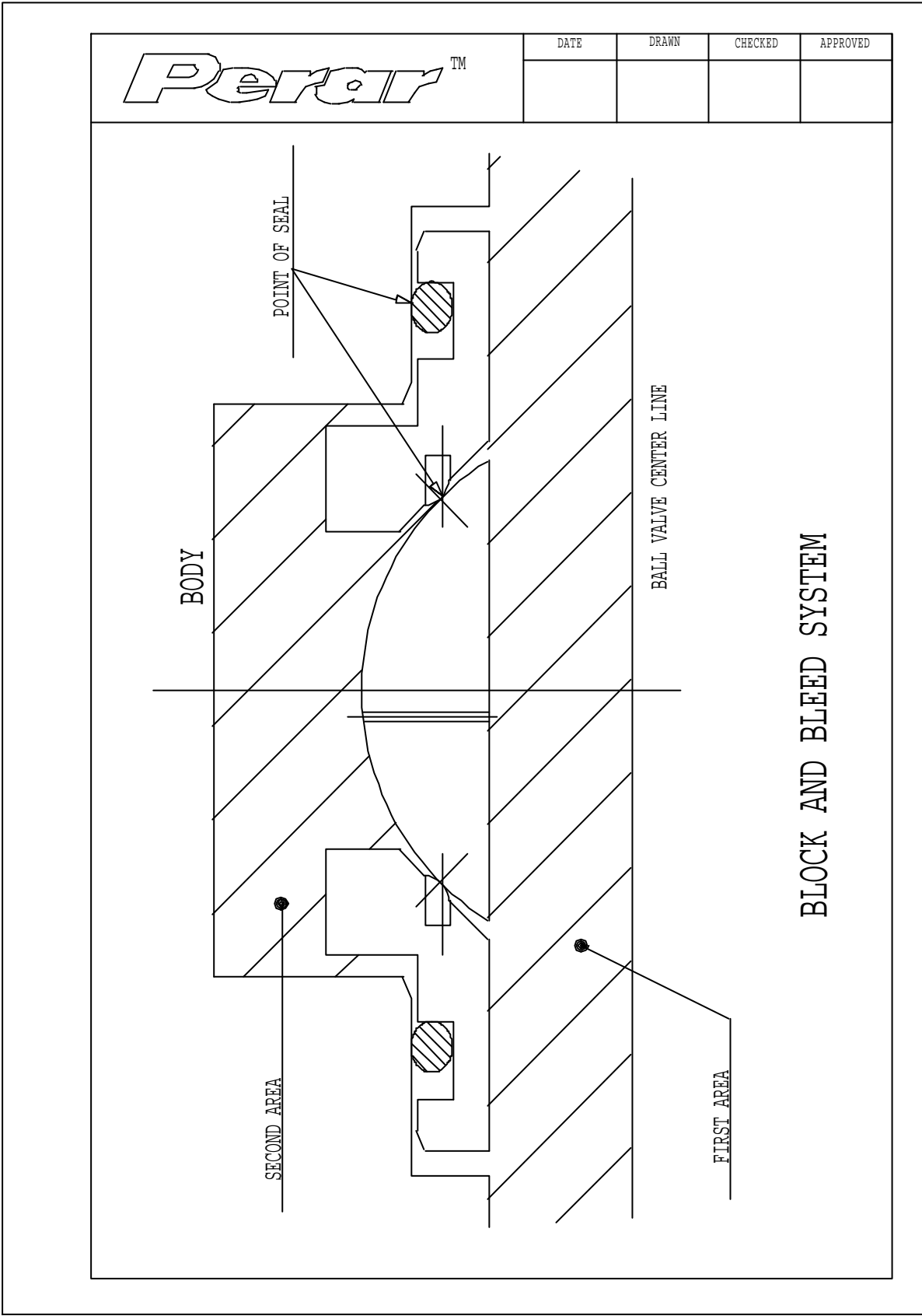
10.1 Anti-static Device and seals detail - Trunnion Valve - ANSI 150#, 300#, 600#



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						P.Order:	AND SEALS DETAIL
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R	ISSUE OR REVISION	DATE	by	ckd	appd		

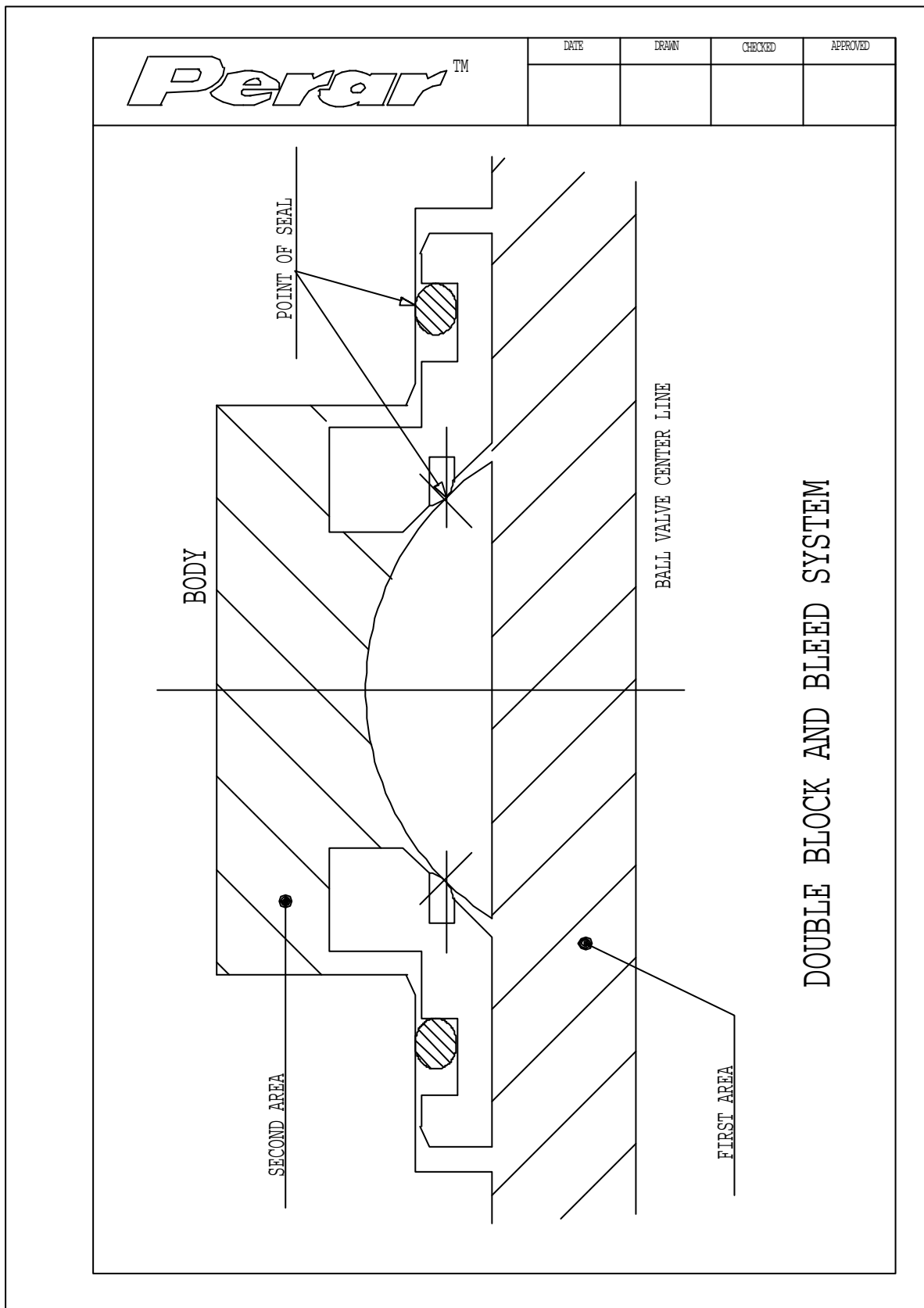
10.2 Anti-static Device and seals detail - Trunnion Valve - ANSI 900#, 1500#, 2500#





<b>Perar</b> ™	DATE	DRAWN	CHECKED	APPROVED

10.3 Block and Bleed System



10.4 Double Block and Bleed System

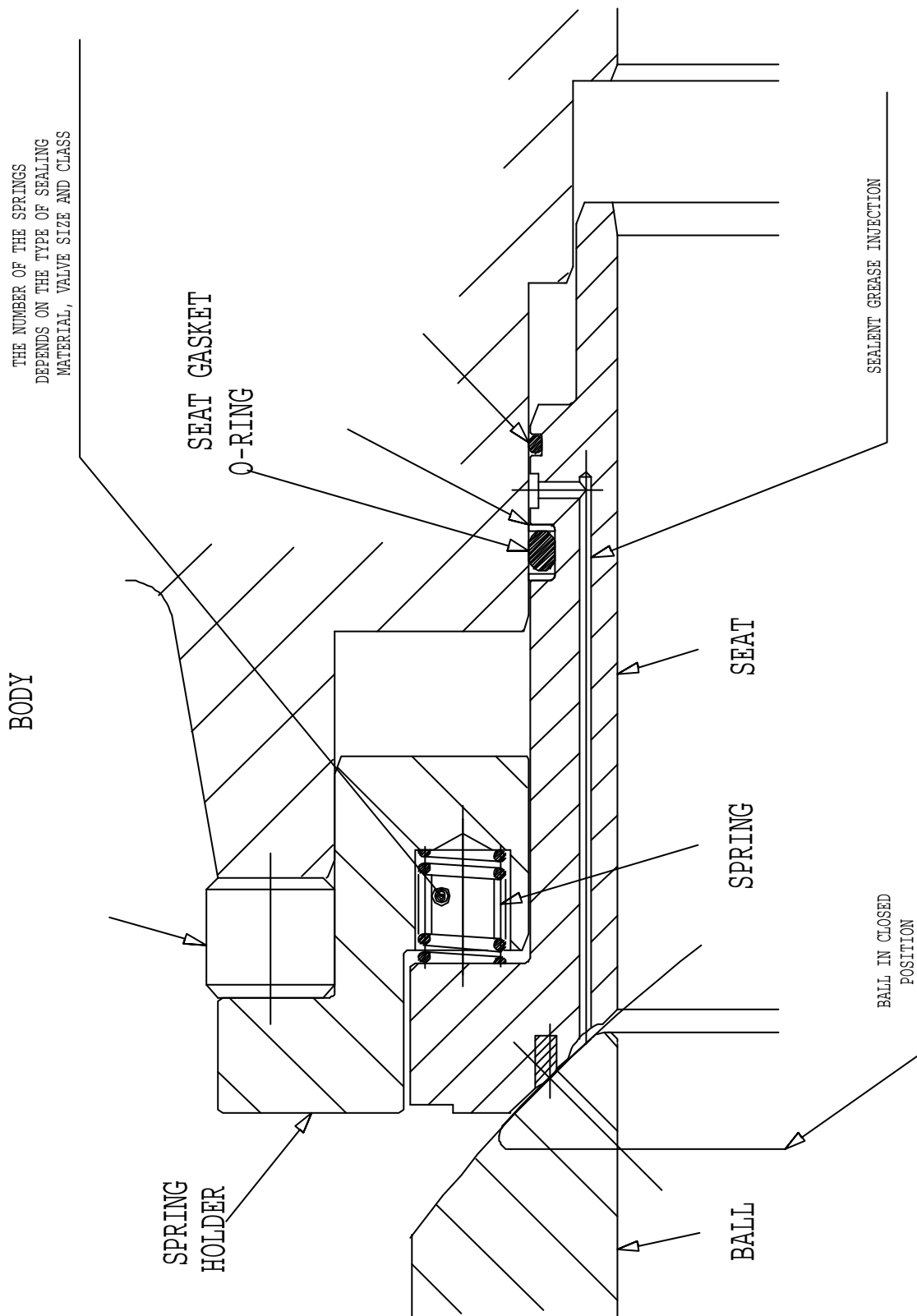
EMERGENCY STEM SEALANT FITTING

EMERGENCY SEAT SEALANT FITTING

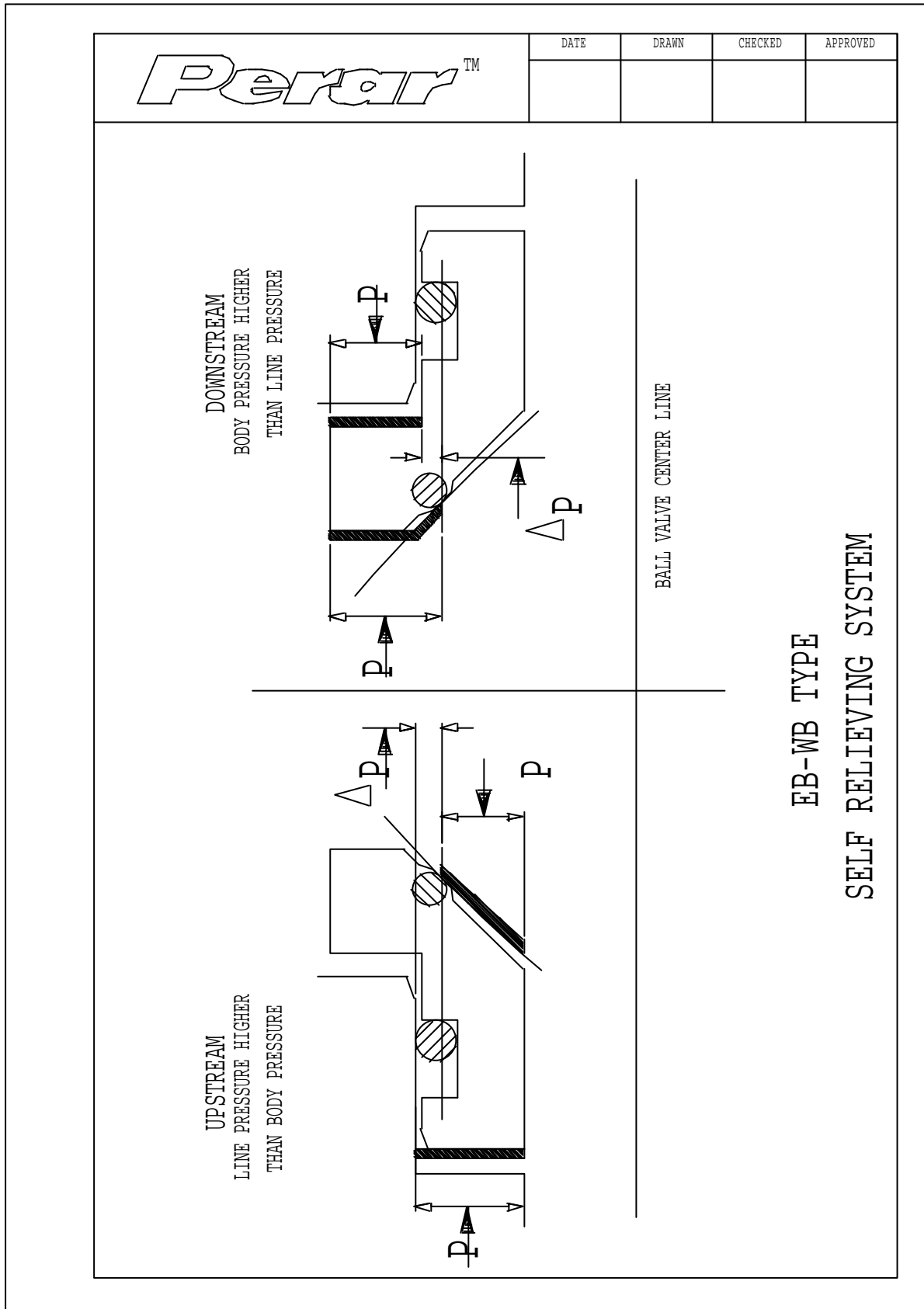
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						P.Order:	DETAIL
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R	ISSUE OR REVISION	DATE	by	ckd	appd		

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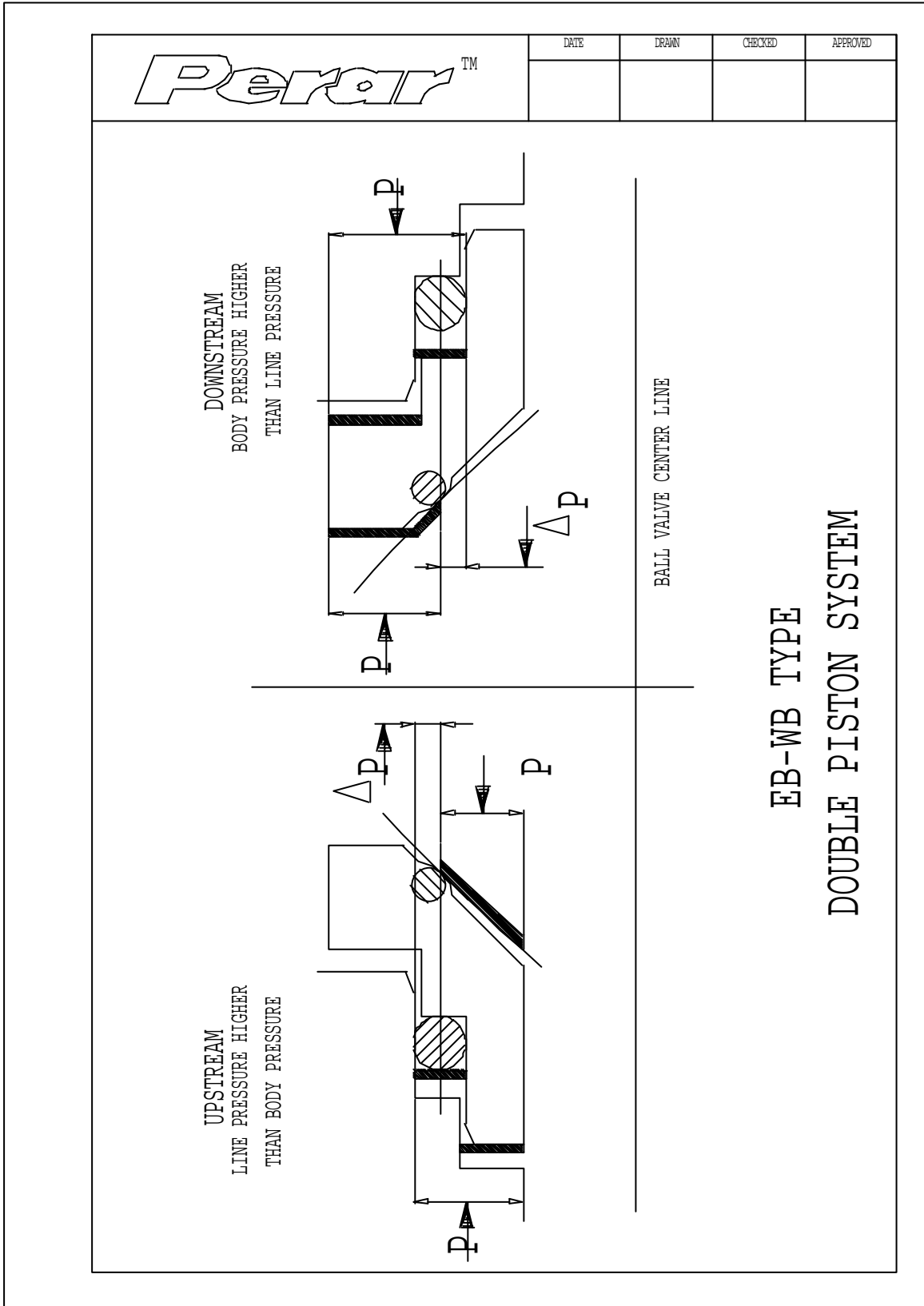
10.5 Emergency Sealant Fittings



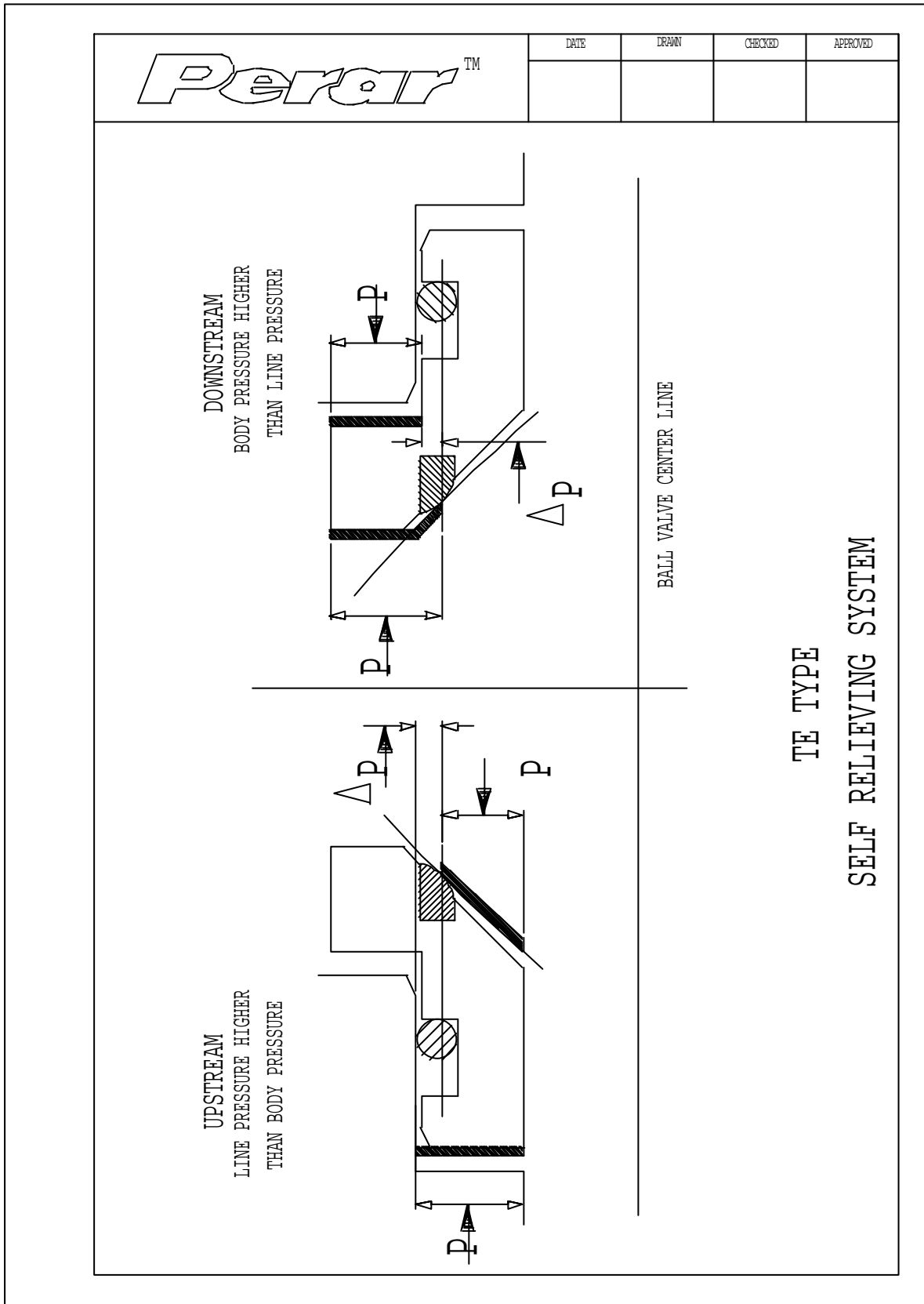
10.6 Seat Seal System Details - TE type



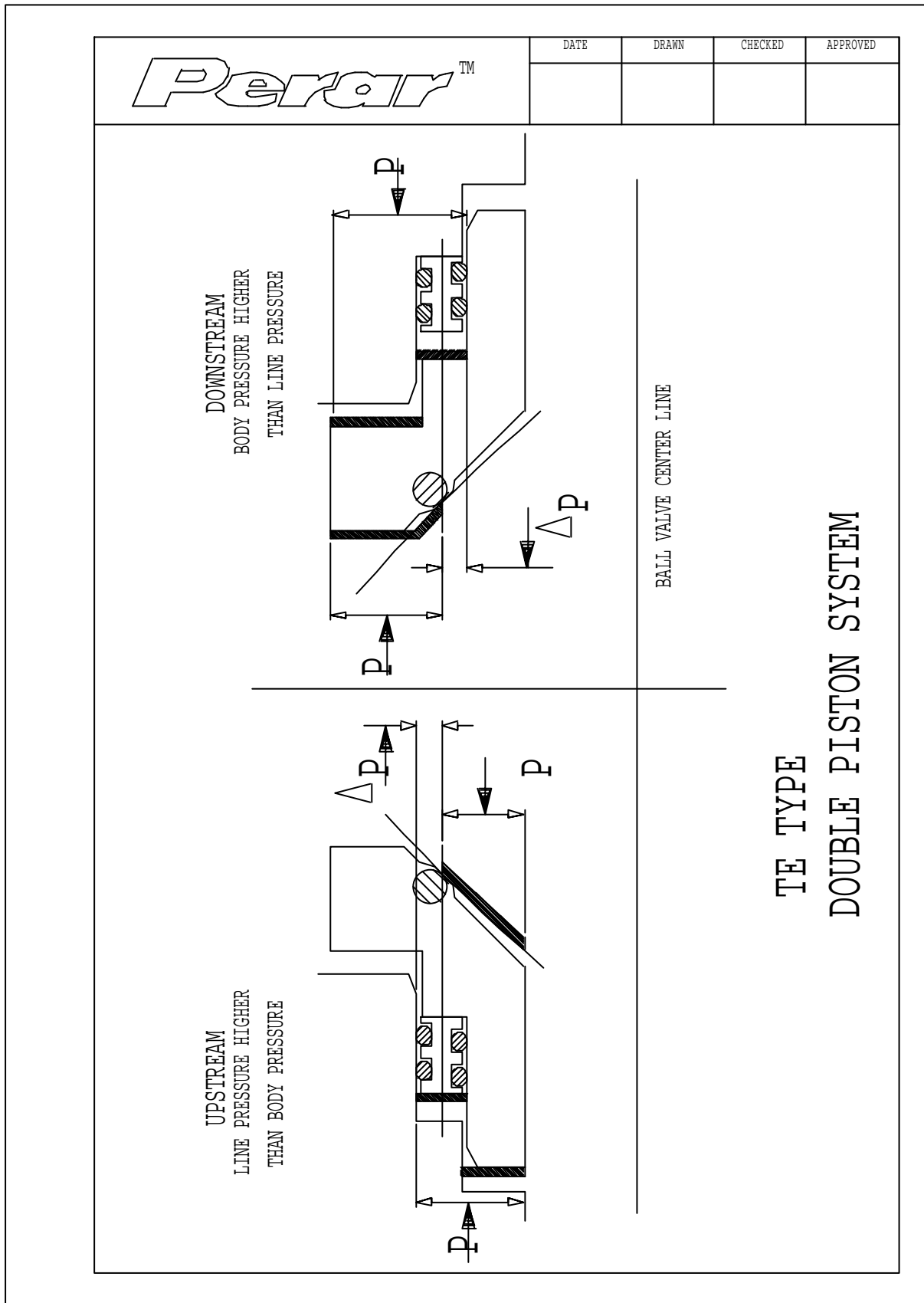
10.7 Self Relieving System - EB WB type



10.8 Double Piston System - EB WB type



10.9 Self Relieving System - TE type



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10.10 Double Piston System - TE type