

Pig launcher/receiver

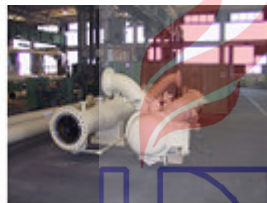


Our main profile is to fabricate valves, and manufacture and design gas-, oil and petrolchemical pressure equipment. Among the products of pressure equipment, we manufacture and design different types of pig launcher/receiver.

Pig launcher/receivers are designed, fabricated and inspected in-house by the company's specialists. Special equipment with various requirements on demand is manufactured in our product line and transported to special places.

Our main profile is to manufacture large and/or high-pressure pig launcher/receiver. This equipment is supplied with a complete technological system, or even in an automated version.

Our equipment is manufactured according to customers' requirements or our own recommendation. This description informs you about our different types of equipment.





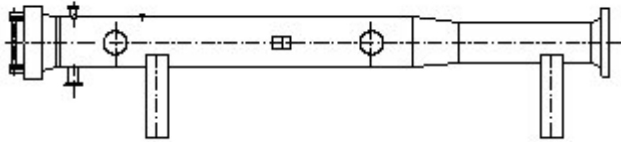
Types

As per transmitter medium:

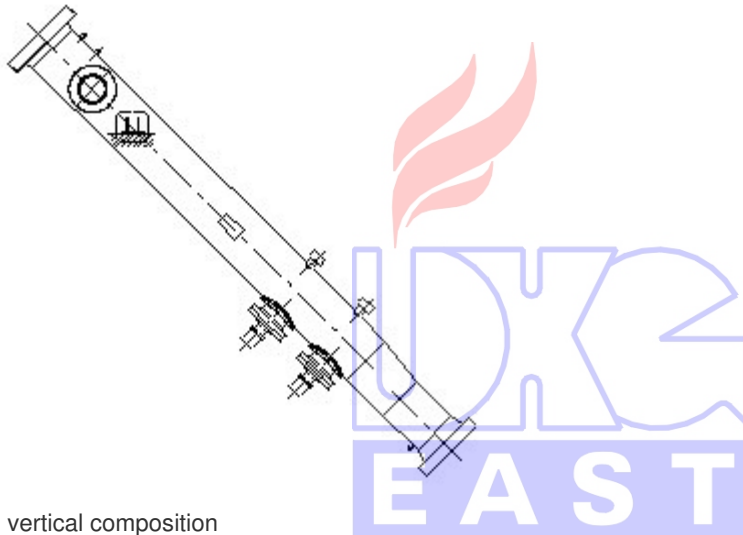
- gas (onshore / offshore)
- oil (onshore / offshore)

As per position:

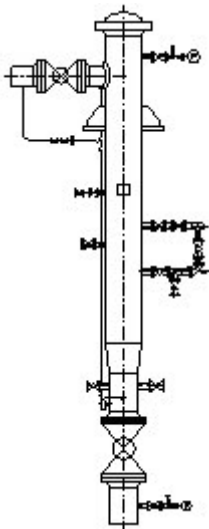
- horizontal composition



- angular composition



- vertical composition



As per function of launching tool:

- repairer (soft material ball)
- cleaner pig
- smart (scanner) pig

As per number of pig:

- competent to launch/receive for one pig
- competent to launch/receive for more pig

As per chamber function of stations:

- launcher
- receiver
- launcher - receiver

As per pressure range:

- CLASS 150
- CLASS 300
- CLASS 400
- CLASS 600
- CLASS 900
- CLASS 1500
- CLASS 2500
- unique pressure according to customer's specification

As per size range:

- 3" – 48" (DN80 – DN1200)
- size according to customer's specification

Applied technical standards

ASME B31.8
ASME B31.4
ASME VIII. DIV1
ASME VIII. DIV2

PED
EN13445
AD2000

Other: N-505 (PETROBRAS)



General setting of a pig-launcher



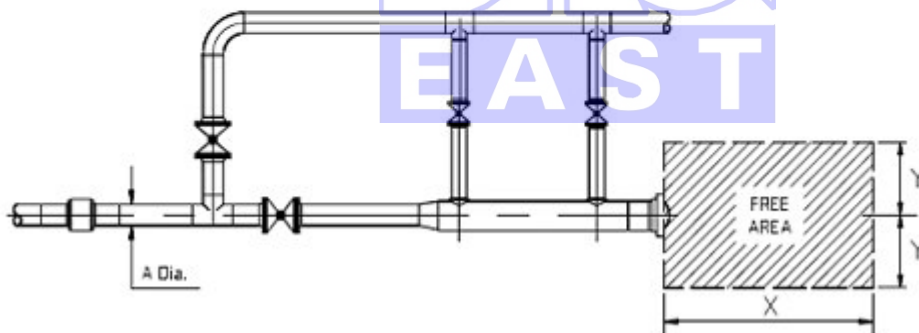
The customer usually has its own regulation system to locate pig-launcher and receiver. Due to lack of this, our company - DKG- EAST- can give the following offer to locate the pig chambers:

TABLE 1 - FREE AREA FOR INTELLIGENT PIG LAUNCHERS AND RECEIVERS

A Nominal Diameter (in)	Free Area	
	X (mm)	Y (mm)
4 to 14	5,000	1,000
16 to 30	6,000	1,400
32 to 42	6,500	1,750

TABLE 2 - FREE AREA FOR CONVENTIONAL PIG LAUNCHERS AND RECEIVERS

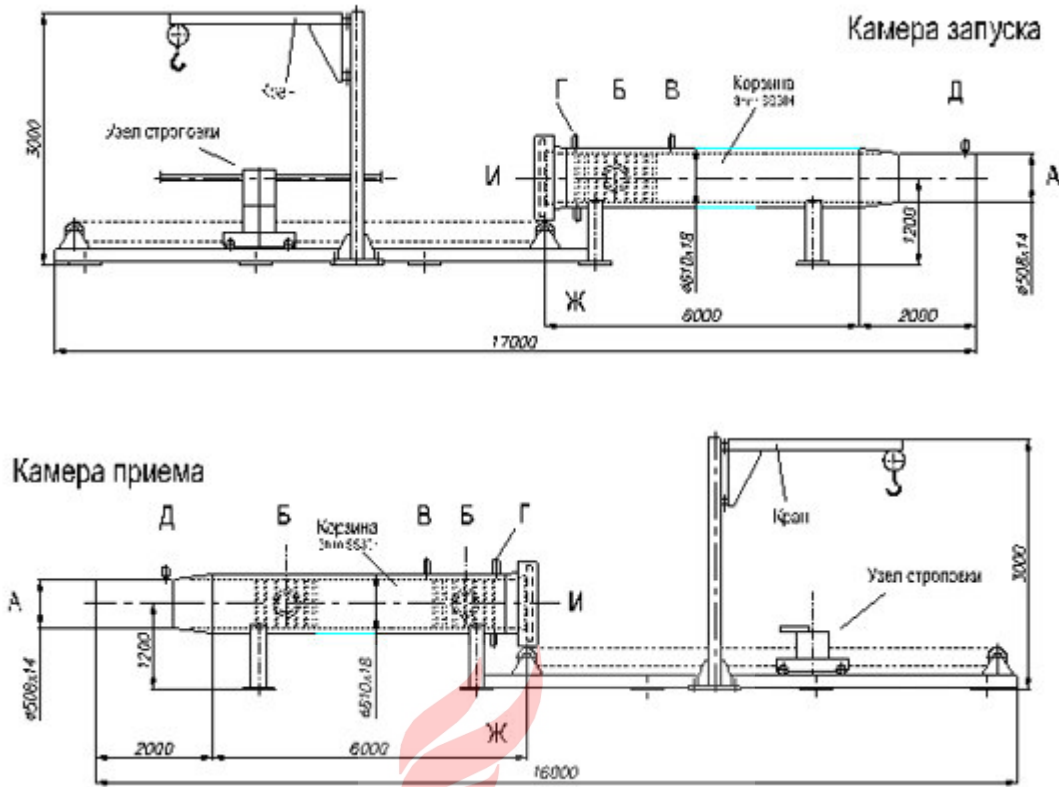
A Nominal Diameter (in)	Free Area	
	X (mm)	Y (mm)
4 to 14	2,000	1,000
16 to 30	3,000	1,400
32 to 48	4,000	1,750



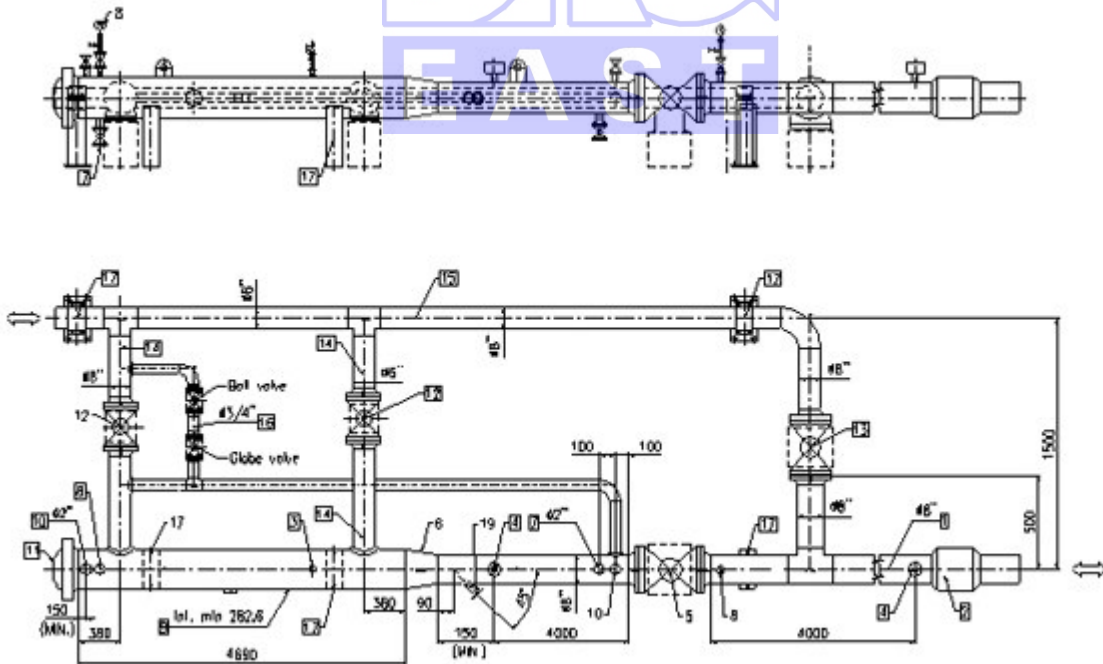
Main parts of the pig-launcher:

- chamber body with pipeline section
- Quick Open Closure (FLASH-LOCK)
- pipeline section
- other nozzles
- davit
- crane
- valves
- safety valves
- sensor, measuring instrument, pig signaler
- control unit

The schemes below show different types of pig- launcher.



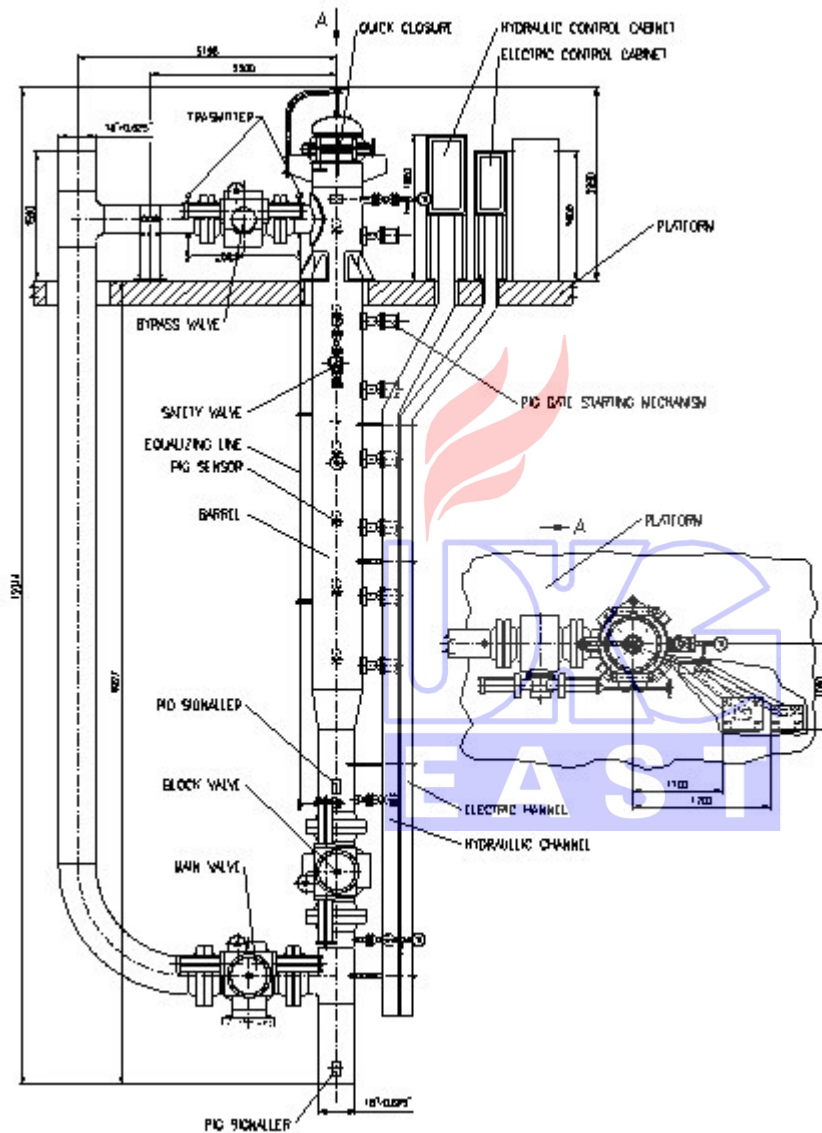
A horizontal type pig- launcher with an inner basket, a control system and a crane but without fittings. The launcher stations are located at the ends of the pipeline. One of the stations is a launcher, the other one is a receiver.



A horizontal type pig- launcher with complete installation. The system is manually controlled and contains electric-operated ball valves.

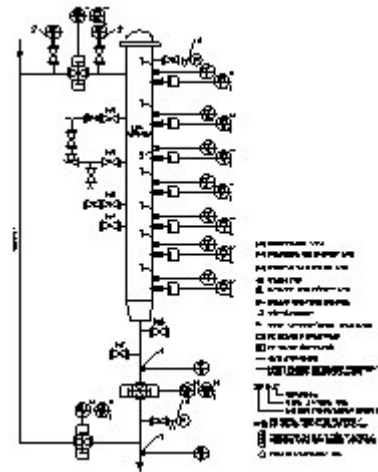
Details of installation:

- pressure retaining chamber
- Quick Open Closure
- pipeline section
- other technologic nozzles
- valves
- operating device
- insulating flanges
- safety valves
- sensor
- pressure gauge
- inside perforated basket



A vertical type automatic pig-launcher station with complete technology and installation can be used for taking in 7 pigs :

- pressurize retaining chamber and pipeline section
- valves, safety valves
- electric, hydraulic operating device
- electric, hydraulic system controlled by PLC
- diverse pressure gauges with position and passage indicator sensor
- electronic connection towards control equipment
- cleaning pigs



Pig chamber

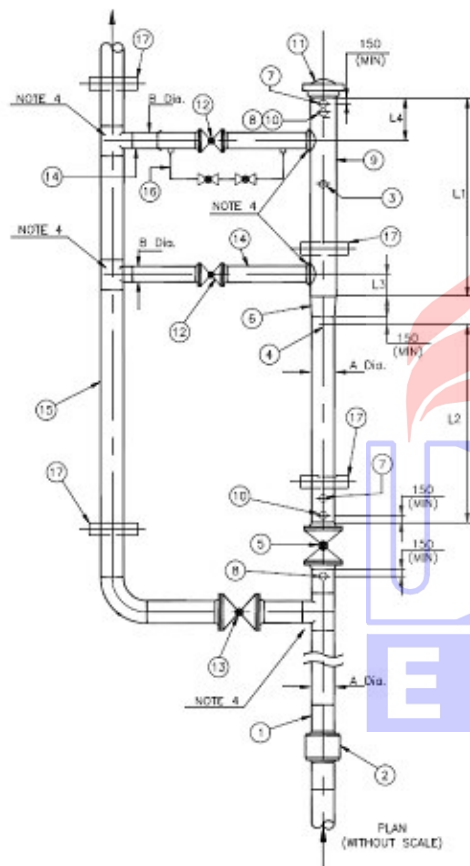


The main parts of a pig chamber:

- pressure parts
- extension
- reducer
- shell
- nozzle
- quick open closure
- inner basket or tray

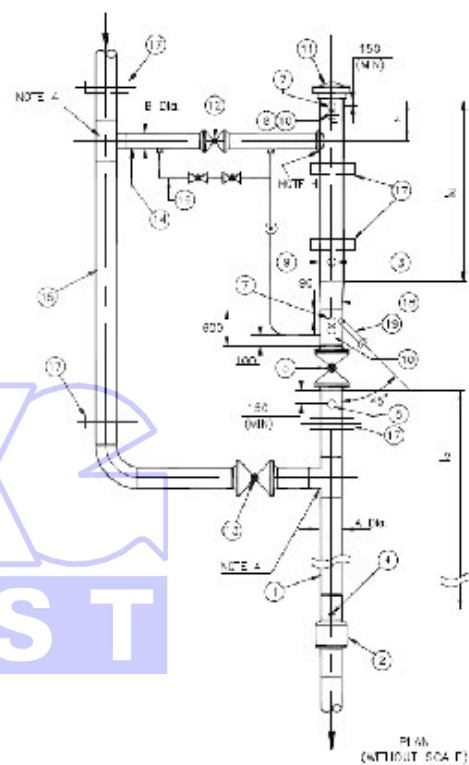
The technician's parameters and requirements are determined by customer instructions. If the customer does not have all the information, our specialists make recommendations. In absence of customer's instruction, DKG-EAST uses the following constructions and sizes:

PIG RECEIVER:



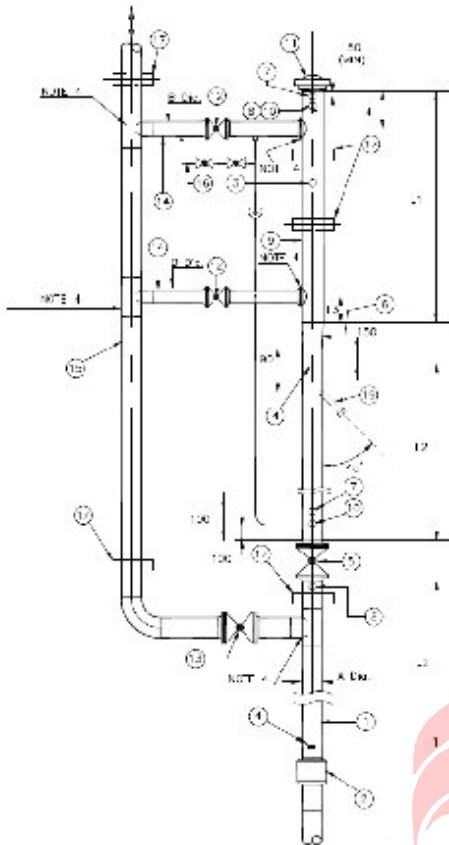
A-1

PIG LAUNCHER:



A-2

PIG LAUNCHER/ RECEIVER:



A-3

LIST OF ITEMS OF FIGURES A-1, A-2 AND A-3

- Item Description**
 1 Pipeline (A Dia.).
 2 Insulating Joint (Note 2).
 3 Thermal relief valve.
 4 Pig Passage Indicator (Note 5).
 5 Trap block valve (full bore).
 6 Concentric Reducer.
 7 Drain (Notes 3 and 7).
 8 Pressure Gauge.
 9 Launching or Receiving Barrel.
 10 Vent (Note 7).
 11 Quick Closing Closure.
 12 Bypass valve.
 13 Main Valve.
 14 Bypass Line.
 15 Main Line (inlet/outlet) (Note 6).
 16 Pressure equalization line 3/4" Dia.
 17 Supports (Note 1).
 18 Eccentric/concentric reducer
 19 Flange Connection (Note 4).

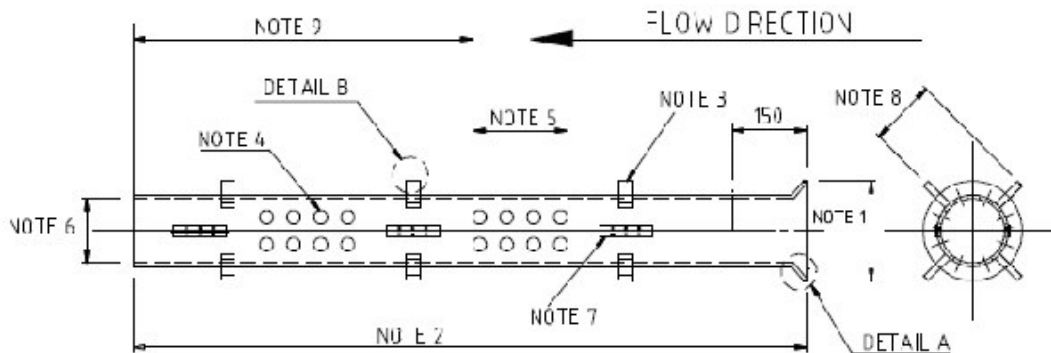
DIMENSIONS FOR INTELLIGENT PIG LAUNCHER, RECEIVER AND LAUNCHER/RECEIVER **DIMENSIONS FOR CONVENTIONAL PIG LAUNCHER, RECEIVER AND LAUNCHER-RECEIVER**

A Nominal Diameter (in)	Dimensions for Figures A-1, A-2 and A-3					Drain Diameter (in)
	L1	L2	L3	L4	B Dia. (in)	
4	3,280	2,800	270	340	3	2
6	3,890	3,300	320	360	4	2
8	4,690	4,000	380	380	6	2
10	4,900	4,100	430	400	6	3
12	4,600	3,700	480	410	8	3
14	4,670	3,700	510	420	8	3
16	4,470	3,400	560	440	10	3
18	4,770	3,600	620	460	12	3
20	5,580	4,300	670	470	12	4
22	4,980	3,600	720	490	14	4
24	5,180	3,700	770	510	16	4
26	5,280	3,700	820	520	16	4
28	4,080	2,800	870	540	18	4
30	4,290	2,800	920	560	20	4
32	4,090	2,800	980	580	20	4
34	4,390	3,200	1,030	590	22	6
36	4,690	3,200	1,080	610	24	6
38	4,790	3,600	1,130	630	24	6
40	5,000	3,600	1,180	640	26	6
42	5,100	3,600	1,230	660	26	6

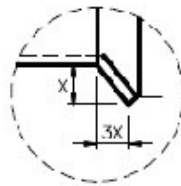
A Nominal Diameter (in)	Dimension for Figures A-1, A-2 and A-3					Drain Diameter (in)
	L1	L2	L3	L4	B Dia. (in)	
4	1,008	1,000	270	340	3	2
6	1,118	1,000	320	360	4	2
8	1,318	1,200	380	380	6	2
10	1,518	1,200	430	400	6	3
12	1,718	1,200	480	410	8	3
14	1,888	1,000	510	420	8	3
16	2,088	1,000	560	440	10	3
18	2,288	1,000	620	460	12	3
20	2,498	2,000	670	470	12	4
22	2,698	2,000	720	490	14	4
24	2,898	2,000	770	510	16	4
26	3,098	2,800	820	520	16	4
28	3,308	2,800	870	540	18	4
30	3,508	2,800	920	560	20	4
32	3,708	2,800	980	580	20	4
34	3,908	3,200	1,030	590	22	6
36	4,108	3,200	1,080	610	24	6
38	4,308	3,600	1,130	630	24	6
40	4,518	3,600	1,180	640	26	6
42	4,728	3,600	1,230	660	26	6

A receiving basket or - in special cases - a receiving tray is located in the chamber. The basket and the tray slow down the pipeline scraper.

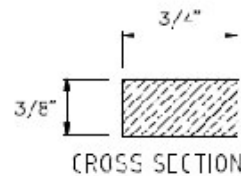
The diameter and type of basket in general applications match the following sizes and design.



PIPELINE DIAMETER (in)	HOLES DIAMETER (in)
4 to 10	3/4
12 to 20	7/8
22 to 28	1
30 to 42	1 3/4



DETAIL A



CROSS SECTION

DETAIL B

Notes:

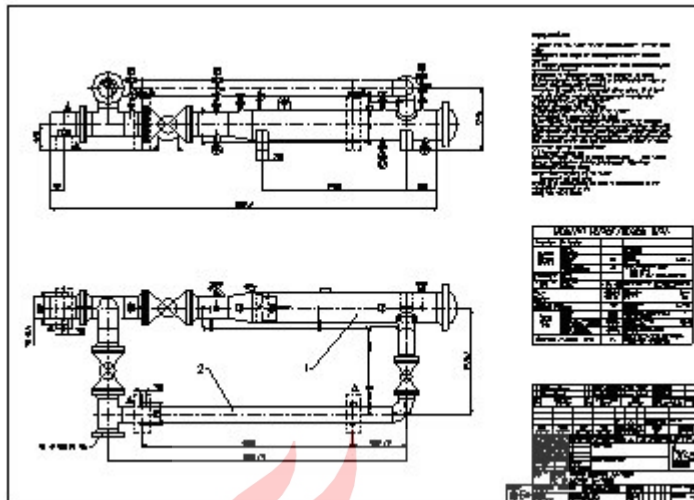
- 1) The inner diameter of the receiver barrel is minus 10 mm;
- 2) Dimension L1 based on TABLES A-1 or A-2;
- 3) Spacers for supporting the cylindrical portion and device centering, made of aluminum plates or bars having dimensions compatible with device weight;
- 4) Holes equally spaced with diameter according to TABLES A-4;
- 5) Two perforated sections of a length equal to twice the diameter A (TABLES A-1 or A-2) which sum of the hole areas of each one shall at least equal to twice the internal cross section of a bypass. Each section shall be placed so that its mediatrix will match the centerline of one of the bypasses;
- 6) The inner diameter of the pipeline (A Dia.) of TABLES A-1 or A-2 plus 5 %;
- 7) The baskets shall be longitudinally split and joined with hinges;
- 8) The inner diameter of the receiver barrel divided by 2;
- 9) In case of more than one pig being received without barrel opening, the amount of pigs lengths is limited to this dimension;
- 10) The baskets shall be made of plates or aluminum pipes or other non-sparking material, with 3 mm minimum thickness;

Design, manufacture and inspection

The pig-launcher stations are designed by our colleagues. The designing parameters and other specifications shall be given by the customer. Conformity to the customer's needs is controlled by the customer or a third party inspector during the design approval.

The technical conformity of products according to PED is certified by Notify Body, the technical conformity of products according to ASME U- stamp is approved by ASME Inspector.

We have the right certificates to design and manufacture. Our quality assurance system meets the international requirements.



Plan for an equipped pig-launcher station



Pressure test

QOC Type FLASH-LOCK

Pig Launchers/Receivers manufactured by DKG are fitted with QOC Type Flash Lock. The QOC can be applied with vertical and horizontal Pig Launchers/Receivers. Depending on the position, the QOC is fitted with coverlifter or cover upturner. In vertical position the bracket of the coverlifter can be used to crane pigs. Handling QOC is very easy and fast, no special expertise is needed. The construction of QOC Type FLASH-LOCK and its setting in the chamber are illustrated below

DN800 PN64bar



Necessary data for quotation/ purchase order



The following details are needed for quotation (detailed description in Clause 2.):

- type of pig launcher/receiver (pig launcher, receiver and launcher/receiver)
- size of pig chamber
- pressure of pig chamber
- design code
- position of pig
- definition of medium
- type of chamber considering the number of pigs
- task of pig launcher considering the instructions
- equipment, transport dimensions
- other order specifications;

A sample technical proposal by us:

TECHNICAL DATA		NOZZLE CHART				
Design pressure (bara)	120	Item No.	Service	Øk	CL	NOTE
Design temperature (°C)	-20...+90	N1	INLET / OUTLET	30	R50	RF/WR
Operating pressure (bara)	110	N2	HEAVY DUTY (RTD)	30	R50	RFH/WRH
Operating temperature (°C)	+10	N3	RT-TRAP	10	R50	RF/WR
Wall thickness (mm)	by code	N4	RT	1	R50	RF/WR
Corrosion allowance	4.8	N8	VENT TRAP	1	R50	RF/WR
Design Factor, F (See Is Code)	0.8	N9	ORAN	1	R50	RF/WR
Joint eff./Factor/FEM	1/1000/2/10 code	N10	ORAN	1	R50	RF/WR
Weight (maximum empty, kg)	14900	N11	PC-SOCKET	1	R50	RF/WR
Weight with spigot (kg)	19400	N12	PC	1	R50	RF/WR
Volume (m ³)	4.0					
Material	SS					
Code requirements	ASME B31.8					

MATERIALS	
Shell	API 5L X65
Head	API 5L X65
Coil	SS spiral wound
Flange	A192
Welding	WPS-85
Paper	API 5L X65
Stud bolts/nuts	A192 B7.7 A194 2H

Doc. status:
PRELIMINARY
FOR BID ONLY

	DKG-EAST HUNGARY	Revision: 02-030095-1 Description: PIG RECEIVER DN30"/36"	Rev: 0	Page: 1 / 1 Total: ---
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References



Some references for pig chamber supplied by DKG-EAST:

EXPORT REFERENCES FOR PIG STATIONS						
No	CUSTOMER	COUNTRY	DENOMINATION	DIMENSION (mm)	WEIGHT (Kg)	NOTE
1	LURGI / PETRONET	South Africa	Pig receiver / Launcher chamber	dia 10"		
2	LURGI / PETRONET	South Africa	Pig receiver / Launcher chamber	dia 12"		
3	GASPROM	Russia	Pig receiver / Launcher chamber	dia.1220 - 8000	7.900	
4	GASPROM	Russia	Pig receiver / Launcher chamber	dia 1220 - 8400	7.900	
5	YUGOROSGAZ	Yugoslavia	Pig receiver / Launcher chamber	dia. 500	2.800	GOST
6	SITEP	Tunesia	Pig receiver / Launcher chamber	dia. 300-350	1.800	ASME
7	TOMSKGAS	Russia	Pig receiver / Launcher chamber	dia. 700	4.800	GOST
8	TOMSKGAS	Russia	Pig receiver / Launcher chamber	dia. 250	940	GOST
9	BOTAS	Turkey	Pig receiver chamber	dia. 1000	8.000	ASME
10	BOTAS	Turkey	Pig launcher chamber	dia. 900	7.900	ASME
11	Energogaz (MANAS Enj.)	YUGOSLAVIA	Pig launcher	DN250 PN50		
12	Energogaz (MANAS Enj.)	YUGOSLAVIA	Pig receiver	DN250 PN50		
13	PETROTECH	AUSTRIA	Pig receiver/launcher chamber	dia.500 mm	2.800	ASME
14	PETROTECH	AUSTRIA	Pig receiver/launcher chamber	dia300-350 mm	1.900	ASME
15	NORMEC	GERMANY	Pig receiver/launcher chamber	dia.700 mm	4.700	ASME
16	NORMEC	GERMANY	Pig receiver/launcher chamber	dia.250 mm	950	ASME
17	DAMAS	TURKEY	Pig receiver chamber	dia.1000 mm	8.200	ASME
18	DAMAS	TURKEY	Pig launcher chamber	dia.900 mm	8.000	ASME
19	PETROBRAS	Brasil	V-101...106 Pig receivers, launchers with ball valves, instruments	24" Class300	6x13000	ASME
20	JURHAROVSK-NEFTEGAS	Russia	Horizontal Pig launchers / Receivers	10"/14" Class600	2x500	AD-M
21	JURHAROVSK-NEFTEGAS	Russia	Horizontal Pig launchers / Receivers	32"/36" Class600	2x6500	AD-M
22	NOVAFININVEST - HANCSESZKOJE	Russia	Horizontal Pig launchers / Receivers	32"/36" Class600	2x6500	AD-M
23	PETROBRAS	Brasil	Horizontal Pig launcher with ball valves, instruments	18" Class600	7.000	ASME
24	PETROBRAS	Brasil	Horizontal Pig launcher	18" Class600	4.000	ASME
25	PETROBRAS	Brasil	Vertical Automatic Pig launcher with ball valves, instruments	18" Class600	14.000	ASME
26	PETROBRAS	Brasil	Horizontal Pig launchers/Receivers	6"/10" Class900	4x700	ASME

Reference pictures of pig chambers designed and manufactured by DKG-EAST on PPER-1 Platform.



Installed horizontal pig chamber



Testing of vertical pig chamber by manufacturer



Hydraulic and electric control panel of vertical and horizontal pig-launcher stations

The system is able to launch seven cleaner pigs manually or automatically which are stored in a vertical chamber. Also, there is a possibility to launch smart (scanner) pig in both modes. The system has an own electric and hydraulic unit. The control is programmed by PLC.

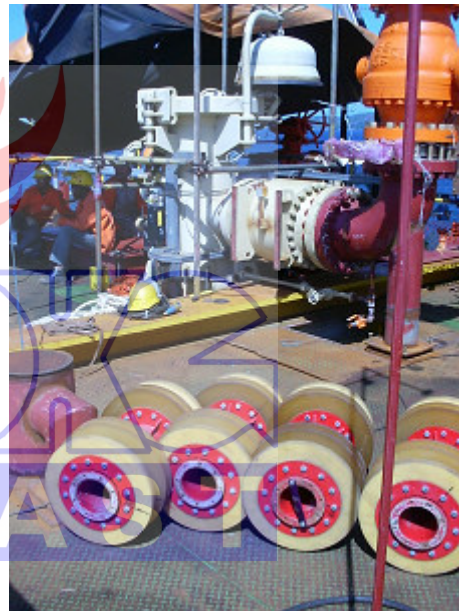
The periodically operated horizontal pig chamber is controlled manually. The power-supply of hydraulically driven ball valves is ensured by a central feed pump controlled in the system.



Set-up of platform by manufacturer. The vertical and horizontal pig chambers are marked.



Building in platform



Loading pigs into a vertical chamber.