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OFFSHORE & SUBSEA TECHNOLOGY

The Company

Carl Kurt Walther GmbH & Co. KG was founded in 1931 as a mechanical engineering company in Wuppertal. Since 1951, the WALTHER PRÄZISION division has been developing and producing mono-couplings, multi-couplings and docking systems used wherever there are liquids, steam, gases, electrical or optical signals and electrical power to be transferred and disconnected safely.

Our engineers develop solutions which fulfil the very strictest demands, prove their worth in adverse conditions and protect the environment in the automotive industry, aerospace and aviation, chemical and pharmaceutical sectors, offshore, medical technology, transportation technology, mechanical and plant engineering and defence technology.

This extensive variety means that today we offer the world's largest programme of mono-couplings, multi-couplings and docking systems with more than 400,000 variations. Nearly every application can be served with our standard programme, and for special cases we offer individual custom designs.

The offshore industry has benefitted for over 30 years from this existing experience and our will to move on.

Since 1992, the certification of our quality management systems according to DIN EN ISO 9001 is a self-evident consequence to WALTHER-PRÄZISION for our high quality demand. We manufacture quick self sealing couplings for the aerospace and aviation industry as well as nuclear technology according to DIN EN 9100 and KTA 1401. Our production for medical technology meets all requirements of DIN EN 13485. Cleanliness classes to SAE AS4059 can be met.

Material selections range from coated carbon steels, over bronze to stainless steals of the 316 class and super duplex kinds. New materials to optimize performance are being tested as they become available.

Pressure ratings starting at 345 bar (5,000 psi) years ago constantly increase. 690 bar (10,000 psi) has become a common standard and is taken beyond to 1400 bar (20000 psi) in some cases.

As sea water depths increase the coupling designs follow. The inhouse pressure chamber verifies correct function of couplings up to 5000 m water depth.



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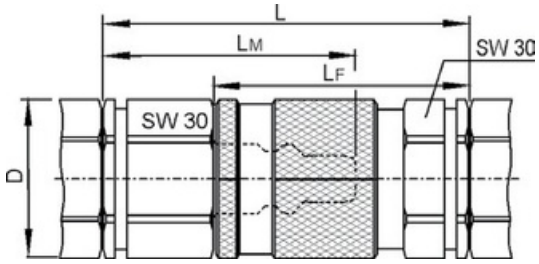
Mono-Couplings

Quick release version

Series HP

e.g. HP-006



Characteristics:

Rugged and reliable design
Wide choice of end connections
Various material versions available
Both sides self sealing

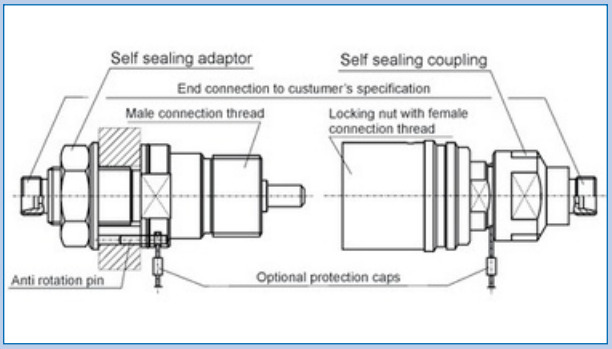
Optional features:

Additionalsafety lock by axial safety sleeve (50 g shock proof)
Non interchangeable versions by keying rings
Pressure venting valves
Dirt - or pressure retaining protection caps

Size	Type	Typical end connection	max. diameter D [mm]	Total body length connected L [mm]	Male half body length LM [mm]	Female half body length LF [mm]	Max. stat. working pressure [psi] carbon steel/ stainless steel	Cv value
1/4 "	HP-004	JIC #4, NPT 1/4", Autoclave 1/4" MP	30,0	71,0	48,0	48,0	30,000/15,000	0,40
3/8"	HP-006	JIC #6, NPT 3/8", Autoclave 3/8" MP	34,0	87,0	54,0	54,0	15,000/10,000	0,65
3/8"	H P- 0 0 6 -Z102	JIC #6, NPT 3/8", Autoclave 3/8" MP	34,0	79,0	54,0	55,0	30,000/15,000	0,65
1/2"	HP- 010	JIC #8, NPT 1/2", Autoclave 1/2" MP	46,0	96,0	66,0	66,5	9,000/7,500	1,85
3/4"	HP- 016	JIC #8, NPT 1/2", Autoclave 3/4" MP	56,0	114,5	77,0	78,0	7,500/6,000	5,50
1"	HP- 020	JIC #12, NPT 1	62,0	126,0	84,0	84,0	6,000/5,000	8,50

Diver screw type version

Series SH



Characteristics:

Both sides selfsealing
Rugged connectors with screw sleeve to connect by screwing action under pressure
Round connection thread for easy action under adverse conditions
End connections to customer specification
Standard material AISI 316 L and F6 Nm or other stainless steel / duplex combinations
Sizes: 3/8", 1/2" and 3/4"
Working pressure: depending on material combination up to 10,000 psi

Optional features:

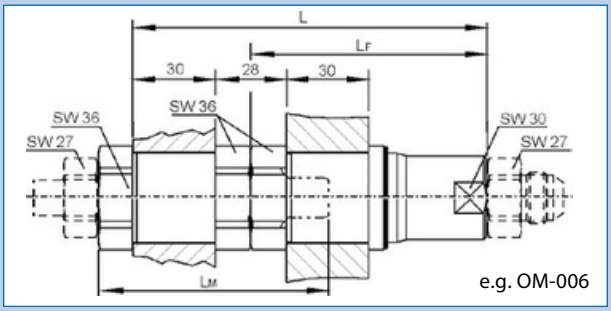
Non-interchangeableversions by different keying components
Sealing technique dual o-ring or metal seal with resilient back up
Connectable under pressure up to 1,500 psi
Metal seals
Also available as hose extension

See also brochure „Series SH"

Coupling elements - Plate mounted

Standard solution

Series OM



e.g. OM-006

Characteristics:

Rugged and reliable design
Both sides self sealing
Wide choice of end connections
Various material versions available (standard = 316 L)
Redundant seals
Metal static seals

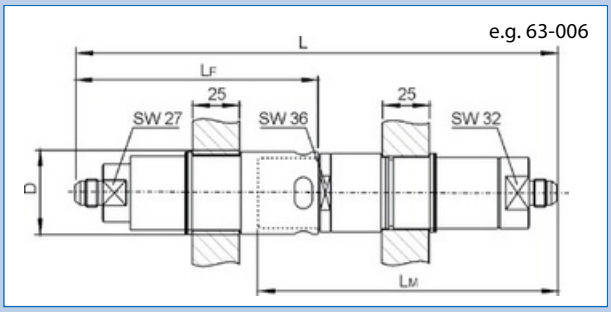
Optionalfeatures:

Shallow water design with dual o-ring seal (-Z04) up to 1000 m water depth
Deep sea design with polymer seal plus resilient back up (-Z05) down to 5000 m water depth
Pressure venting valves
External pressure resistant valves
Front or rear mounting variants
Metal primary seal (c-ring)

Size	Type	Typical end connection	Max. diameter D [mm]	Total body length connected L [mm]	Male half body length LM [mm]	Female half body length LF [mm]	Max. stat. working pressure[psi]	Cv value
1/4 - 3/8“	OM-006	Thread or weld stub	40,0	153,0	91,5	93,00	10,000	0,65
1/2“	OM-010	Thread or weld stub	55,5	189,5	112,5	116,0	10,000	1,85
3/4“	OM-016	Thread or weld stub	61,3	196,0	117,5	121,0	10,000	6,00
1“	OM - 020	Thread or weld stub	72,6	284,0	194,0	151,0	10,000	10,9
1 1/4“	OM - 025	Thread or weld stub	78,2	294,0	194,0	161,0	10,000	16,75

Pressure balanced

Series 63



e.g. 63-006

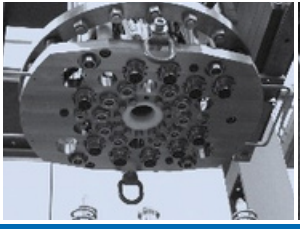
Characteristics:

Free of separation forces when connected
Both sides self sealing
Wide choice of end connections
Various material versions available (316 L, Nitronic 50)
Redundant seals

Optionalfeatures:

Venting valve in disconnected position
Customised mounting geometry

Size	Type	Typical end connection	Max. diameter D [mm]	Total body length connected L [mm]	Male half body length LM [mm]	Female half body length LF [mm]	Max. stat. working pressure [psi]	Cv value
1/4 - 1/8“	63-006	Thread or weld stub	40,0	246,0	153,0	128,0	10,000	0,65
1/2“	63-010	Thread or weld stub	55,5	330,0	166,0	183,0	10,000	1,85



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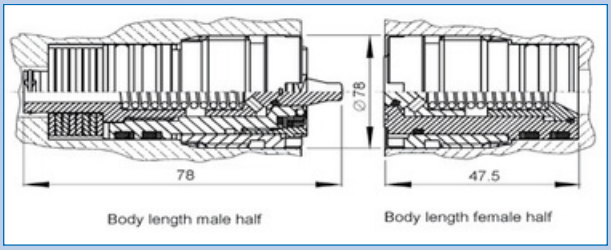
Coupling elements - Cavity mounted with high angle release

Metal sealed

Type 84-006



Characteristics:

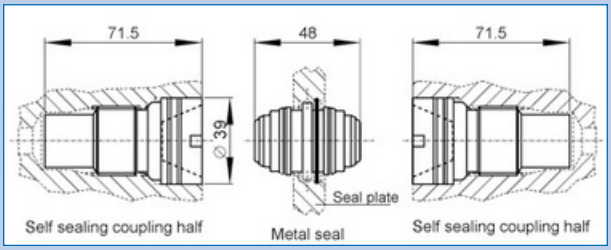
Metal to metal primary seal
100 and more connection cylces with the same metal seal
Possibility to connect with strong angular inclination 6° with hinge point distance > 80 mm
Both sides self sealing
Flush cavity mounting
Max. working pressure 12,500 psi
Cv value 0,56
Redundant seals

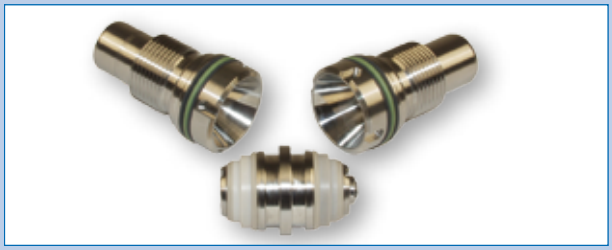
Optional features:

Resilient seal version for work shop operations
Increased body size version for misdrilled cavities
Long stroke elements for large lateral tolerances

ROV exchangeable seals

Type 0E-006





Characteristics:

Metalto metal sealing cone situated in separate seal carrying plate between 2 hubs
Seal plate ROV exchangeable
Metal seal reusable up to 10 connection cycles
Coupling halves self sealing
Valves resistant to external pressure
Design approved for 5000 m water depth
Max. working pressure 5,000 psi
Wide angle connectability

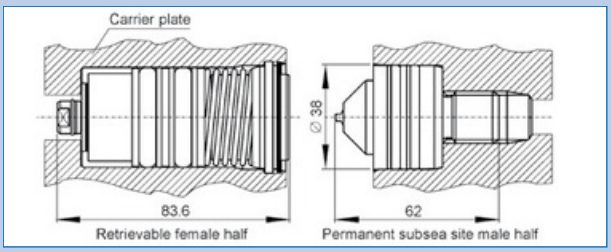
Optional features:

High angleconnectability
PTFE seal instead of metal seal

1/2“ size also available (0E-010 / 10,000 psi)

Polymer sealed

Type 82-007



Characteristics:

Cavitymountedcoupling element
Both sides self sealing
Max. working pressure 5,000 psi
Conical face seal in PTFE
Possibility to connect with strong angular inclination 10° with hinge point distance 90 mm
Max. water depth 3400 m

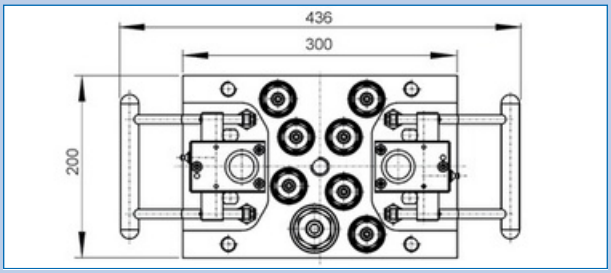
Optional features:

Versionto suitstandard Petrobras cavity
Flush face version
Thru type versions (without valves)
Max. working pressure 10,000 psi

Workover stab plates

Cam locking (small)

e.g. Type 90735 8-way



Characteristics:

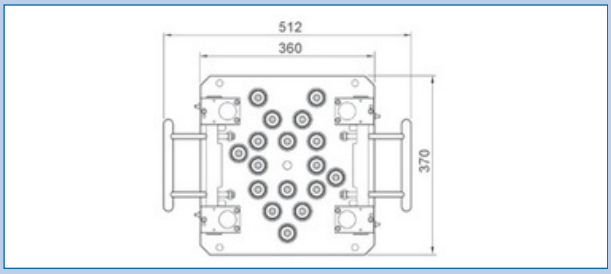
Camaction assisted 8-way plate
Populated with: 7 coupling elements type OM-006-Z04 (3/8")
1 coupling element type OM-010-Z04 (1/2")
Working pressure: 10,000 psi
Secured position for handles in connected position

Optional features:

Super duplex materials
Protection covers
Variation in element population
Strain relief

Cam locking (medium)

e.g. Type 90771 17-way



Characteristics:

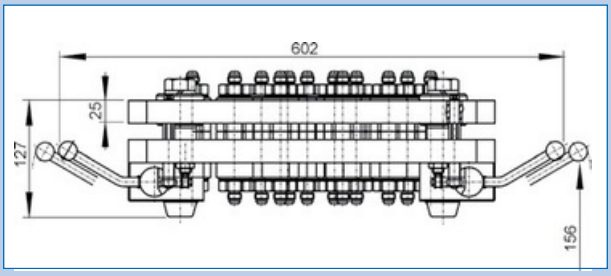
Camaction assisted 17-way plate
Populated with: 17 coupling elements type OM-006-Z04
Working pressure: 10,000 psi for each single element
Secured position for handles in connected position

Optional features:

Super duplex materials
Protection covers
Variation in element population
Strain relief

Cam locking (large)

e.g. Type 90734 30-way



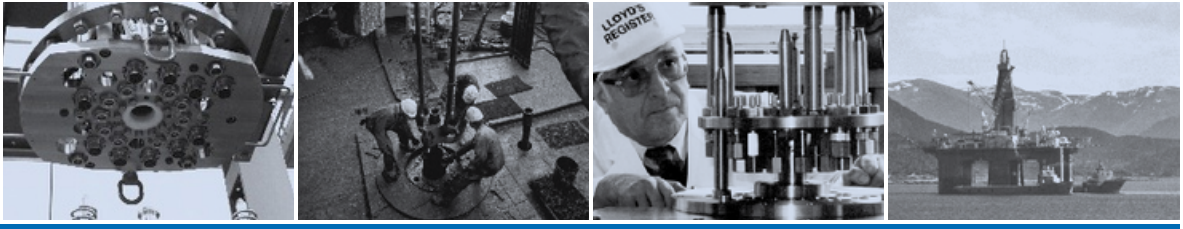
Characteristics:

Camaction assisted 30-way plate
Populated with: 30 coupling elements type HP-006-Y0A
Working pressure: 5,000 psi for each single element
Secured position for handles in connected position

Optional features:

Super duplex materials
Protection covers
Variation in element population
Strain relief

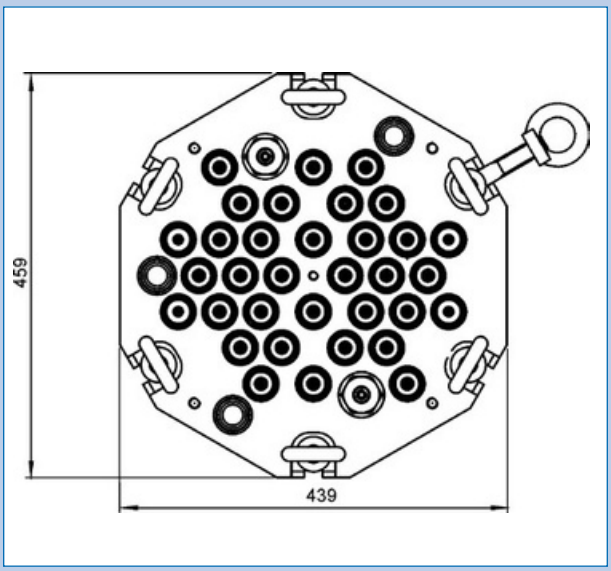
See also brochure „Manual Stabplates"



Workover stabplates

Swing bolt locking

e.g. Type 91547 / Type 915539



Characteristics:

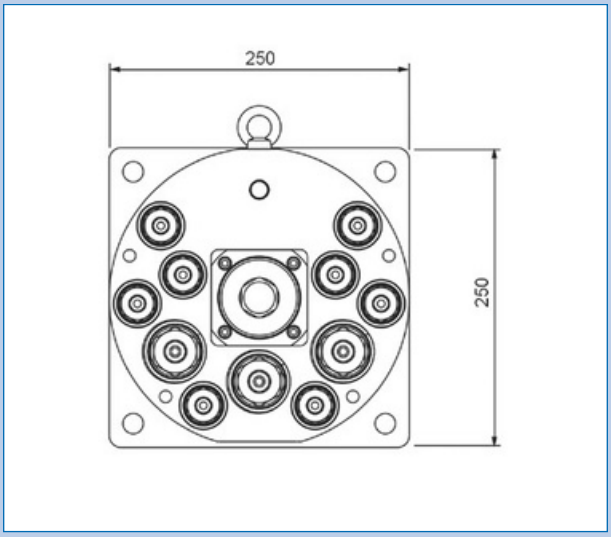
6 swingboltsto lock up to 36 coupling elements.
Populated with: 30 coupling elements type OM-006-Y7C for 5,000 psi 4 coupling elements type OM-006-Y6C for 10,000 psi 2 coupling elements type OM-010-Y90 for 5,000 psi

Optional features:

Superduplexmaterials
Protection covers
Variation in element population
Strain relief

Central screw locking

e.g. Type 91579



Characteristics:

Central locking bolt
Populatedwith:3 OM-010-Z04 for 10,000 PSI
8 OM-006-Z04 for 10,000 PSI

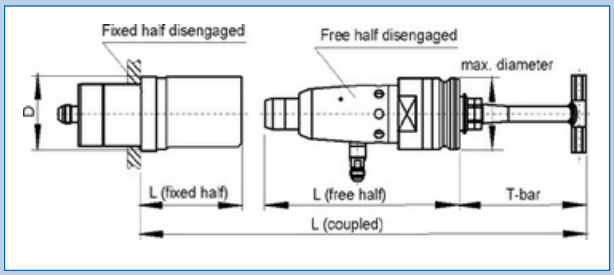
Optional features:

Superduplexmaterials
Protection covers
Variation in element population
Strain relief

See also brochure „Manual Stabplates“

ROV single couplings

ROV single couplings for hydraulic controls and chemical injection — Series 87



Characteristics:

Manipulator make and break, no special tooling required
Connects under full working pressure. Make up torque only 40 Nm.
Max. working pressure 10,000 psi
Sizes 6, 10 and 16 mm
Cv value 0,56 - 5,34
All primary seals and moving components on retrievable half
Metallic primary seal with resilient back up
Metal seal good for +100 connection cycles

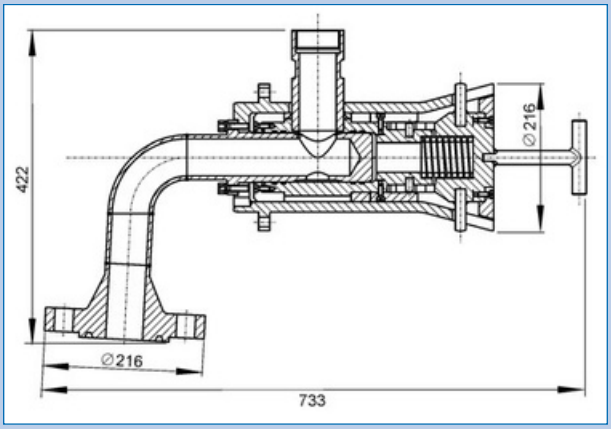
Optional features:

ROVhandleas T-bar,or other profile, ROV bucket
2 non-interchangeable versions by mechanical profile
Shallow water version up to 1000 m water depth
Deep sea version up to 5000 m water depth
Supplied as complete tested system with jumper hose (HFL)
15,000 psi working pressure version 87-G08

See also brochure „Series 87"

Size	Type	Typical end connection	Max. diameter D [mm]	Total body length connected L [mm] * incl. ROV-Interface	Free half body length connected / disconnected L [mm]	Free half T-bar L [mm]	Fixed half body length L [mm]	Max. stat. working pressure [psi]	Cv value
1/4"	87-006	Autoclave, JIC/TUBE	96	236 / 412*	268 / 286	176	150	10,000	0,56
1/2"	87- 010	Thread or weld stub	96	250 / 425*	280 / 316	176	163	10,000	1,64
3/4"	87- 016	Thread or weld stub	120	279 / 474*	384 / 427	195	180	10,000	5,0

ROV single couplings for gas lift — Type 87-050



Characteristics:

ROV operated by claw action only (no tools required)
Pressure balanced in connected position (no reaction force)
Max. working pressure 5,000 psi
Thru type version
All primary seals and moving components on retrievable half

Optional features:

ROVhandleas T-bar, or other profile
Pressure sealing caps
Pressure caps with relief valves
Also available in 32 and 100 mm

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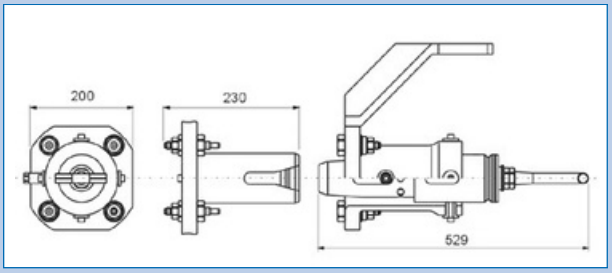
ROV Stabplates

ROV operated stab plate (light weight)

Type 91568



Small umbilical or bundle solution:

91568 –isbeing operated bythe ROV manipulator, or in case of heavily amored and stiff umbilicals also by API 17D torque tools. The central locking mechanism is orientated on the central funnel, pushed forward until metal end stop and then turned until final stop is reached. Locking balls radially lock into the funnel and the carrier plate moves forward to make final connection with the subsea plate. This locking principle has been used and proven in many subsea projects.

Characteristics:

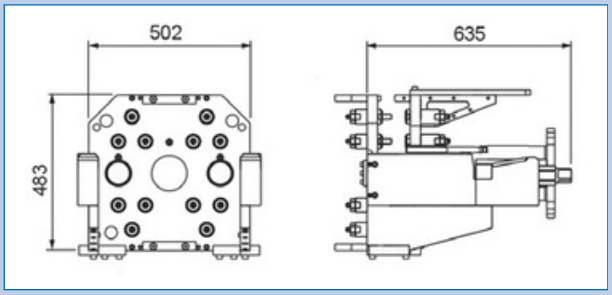
- Easyoperation byROV claw
- Population with up to 6 coupling elements for 10,000 psi
- Unique anti rotation termination between coupling elements and umbilical tubes
- Reliable locking mechanism
- Gripping interface to API-17D class 2
- alternative torquet tool bucket to ISO 13628-8 class 2

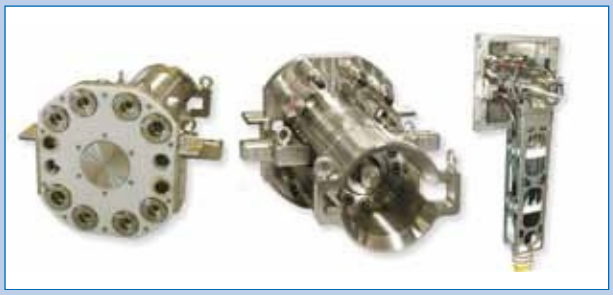
Optional features:

- Morecouplingelements with reduced working pressure
- Umbilical termination flange acc. to project requirement
- Full systems (stab plate + umbilical) available as complete tested HFL
- Parking stations and covers

ROV operated stab plates (heavy duty)

Type 91548 and 91561





Large umbilical solution:

91561 - which requires an API 17D class 4 tool or similar to handle the increased total mass.
The ROV drops the unit on to the catching arms of the fixed half. It will rest prepositioned in the cut outs.
From there the torquing action of the torque tool will move the plate with the coupling elements in a controlled manner to final engagement.

Characteristics:

- Easy operationofstiff umbilicals by very forgiving prealignment process and secured final engagement
- ROV carrying mode is sufficient for operation
- Umbilical termination as all welded solution or with unique anti-rotation fitting
- Population with up to 17 coupling or electrical elements

Optional features:

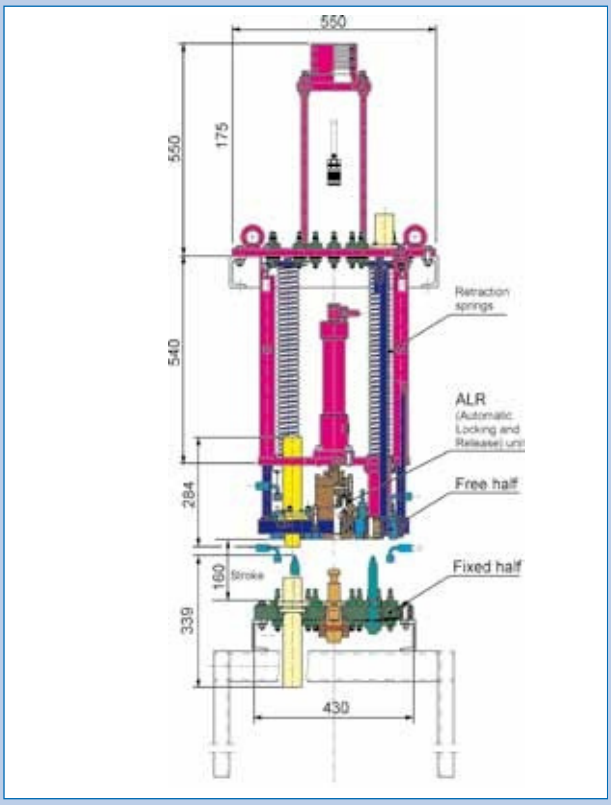
- Umbilicalterminationflange acc. to project requirement
- Full systems (stab plate + umbilical) available as complete tested HFL
- Parking stations and covers

See also brochure „ROV stabplates“

Emergency Disconnect Units

EDUs are coupling systems which separate in a planned and controlled way on special command. Mostly used on BOPs the separation sequence can be initiated by pulling force or a hydraulic signal coming from a remote control. Various mechanical or hydraulic solutions are possible.

Systems which do not use shear bolts are superior and cost saving as they can be brought back into operation without component replacement thus bringing the system back to money making operation much faster. This allows to test them at any time to verify the function.



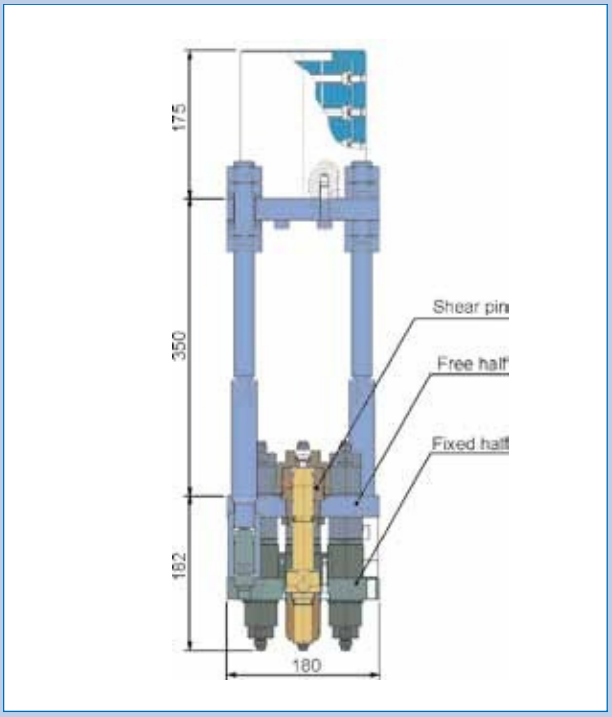
e.g. Type 91355

Characteristics:

Movement bysingle or double action cylinder
Connected position secured by WALR (mechancial lock, hydraulic release) unit
Hydraulic power can be switched off in connected position
WALR opens lock on hydraulic command
Either cylinder action or retraction springs will separate coupling halves
Operates under full system pressure
Mechanical override by shear pin in case of hydraulic failure
Upper interface plate for easy termination of umbical
Max. misalignments on make up: +/- 3mm

Population:

18selfsealing coupling elements 3/8" size, type HP-006
Elements optional with deep sea check valves to avoid water ingress
1 x Electro connector, 4-way
Free half optional with jumper hoses between interface and carrier plate



e.g. Type 91571

Characteristics:

Manual makeupby central screw element
Emergency separation by breaking shear pin in the locking element
The use of pressure balanced coupling elements ensures that no reaction force of the working pressure will influence the break away result

Optional features:

6pressurebalancedcoupling elements, type 63-006, working pressure 10,000 psi
Size 3/8"



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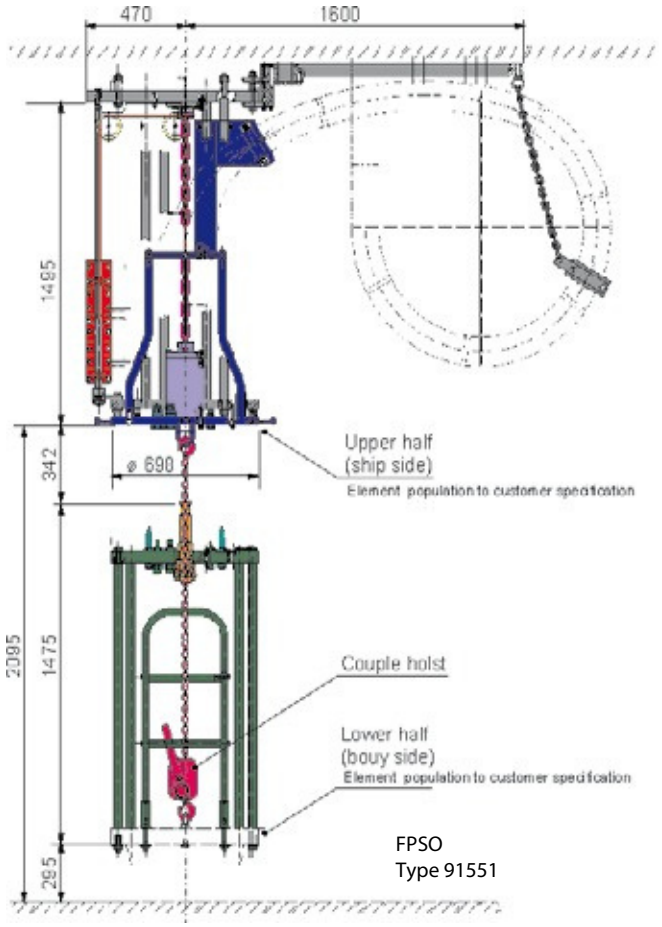
Docking systems FPSO Buoy connectors

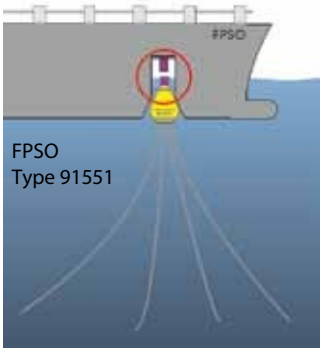
FPSOs can be threatened by a number of environmental conditions such as icebergs or hurricanes. It is then of utmost importance to separate the FPSO from the riser buoy to avoid disastrous damage. After letting the threat pass speedy repositioning and reconnection limits production loss to a minimum.

Walther QCDC (quick connect, disconnect) systems allow to separate hydraulic control lines, chemical injection lines and electro cables within a few minutes by remote control only. This is done safely at any pressure situation. Reconnection is facilitated by manually pulling the halves together again.



FPSO
Type 91551

FPSO
Type 91559



FPSO
Type 91551

Characteristics:

Manual connection by ratchet and chain.
Automatic release by hydraulic unlocking signal to WALR and subsequent automatic separation by gravitational counter weights
Hanging arrangement of upper ship half to tolerate misalignments between buoy and ship +/- 12 mm side to side and 2° angular

Example 1

28 coupling elements, type OM-006-Z03, wp 10,000 psi
1 coupling element, type OM-016-Z03, wp 7,500 psi
7 electro connectors, type 95290-Z03, 4 way, 20 V
3 electro connectors, type 95290-Z03, 37 way, 20 V
2 electro connectors, type 95291, 4 way, 690 V
All wet mateable, ex-protected, PTB and CSA approved
Self sealing adaptor elements (buoy side) with external pressure resistant valves
Fire protected hoses
System DNV approved

Optional: other populations

Example 2

2 coupling elements type HP-006-Y9C, wp 10,000 psi
10 coupling elements type HP-010-Y92, wp 7,500 psi
3 coupling elements type HP-016-Y44, wp 5,000 psi
13 electro connectors, type 95290, 4 way, wet mateable, ex-protected fully potted with Draka or Duco cable
Electro connectors with PTB and CSA approval

Optional: other populations

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