Print the IMO certificates
and save it as a paper copy for
Port State Control.

Final Documentation
TURBULO Mechanical Phase Breaker
Type: TMPB-10
Shipyard: Daewoo Shipbuilding & Marine
Hull: 5425
SKF order no: 1158838
Imo: 9776547
Rev:1
Number of prints: 4

Issued by ES
11/14/16

Table of Contents for 15 ppm bilge separator

Chapter 1

Certificates

Typenzulassungszeugnis
für 15 ppm Ölfilteranlagen

Certificate of Type Approval for
15 ppm Bilge Separator

Ausgestellt im Namen der Regierung der
BUNDESREPUBLIK DEUTSCHLAND
durch die BERUFSGENOSSENSCHAFT FÜR TRANSPORT UND VERKEHRSWIRTSCHAFT
Issued under the authority
of the Government of the FEDERAL REPUBLIC OF GERMANY
by Berufsgenossenschaft für Transport und Verkehrswirtschaft

Hiermit wird bescheinigt, daß die nachstehend aufgeführte 15 ppm Ölfilteranlage einer Prüfung unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in Teil 1 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.107(49) erprobt wurde. Dieses Zeugnis ist nur für die nachstehende 15 ppm Ölfilteranlage gültig.
This is to certify that the 15 ppm Bilge Separator listed below has been examined and tested in accordance with the requirements of the specifications contained in part 1 of the annex to the guidelines and specifications contained in IMO-Resolution MEPC.107(49). This certificate is valid only for 15 ppm Bilge Separator referred to below.

15 ppm Ölfilteranlage geliefert durch — **SKF Blohm + Voss Industries GmbH, Hermann-Blohm-Str. 5, 20457 Hamburg**
15 ppm Bilge Separator supplied by

Typbezeichnung — **TURBULO Mechanical Phase Breaker TMPB 10**
under type and model designation

und besteht aus
and incorporating

15 ppm Ölfilteranlage hergestellt durch — SKF Blohm + Voss Industries GmbH
15 ppm Bilge Separator manufactured by

Zusammenstellungszeichnung-Nr. — SED: 1-499-0202-000.0 — Datum — 10.08.2004
to specification/assembly drawing No. — *date*

Coalescer hergestellt durch — SKF Blohm + Voss Industries GmbH
Coalescer manufactured by

Zusammenstellungszeichnung-Nr. — SED: 4-489-0928-000.0 — Datum — 13.08.2004
to specification/assembly drawing No. — *date*

Filter hergestellt durch — --
Filters manufactured by

Zusammenstellungszeichnung-Nr. — -- — Datum
to specification/assembly drawing No. — *date*

Andere Komponenten — --
Other means

Zusammenstellungszeichnung-Nr. — -- — Datum
to specification/assembly drawing No. — *date*

Steuergeräte hergestellt durch — SKF Blohm + Voss Industries GmbH
Control equipment manufactured by

Zusammenstellungszeichnung-Nr. — SEZ: 4-489-0927-000.0 — Datum — 11.08.2004
to specification/assembly drawing No. — *date*

Versorgungspumpenleistung — 10,0 m³/h
Supply pump capacity

Motorleistung — 3,0 kW
Motor rating

Maximaler Durchfluss des Systems — 10,0 m³/h
Maximum throughput of system

Wenn die Zubringerpumpe nicht Anlagenteil des Systems ist, so ist das vorgesehene Verfahren anzugeben, das sicherstellt, daß der maximale Durchfluss des Systems nicht überschritten wird.
If integral feed pump is not fitted state method proposed for ensuring maximum throughput of system is not exceeded.

Eine Kopie dieses Zeugnisses soll jederzeit auf jedem Schiff mitgeführt werden, das mit dieser Ölfilteranlage ausgerüstet ist.
A copy of this Certificate should be carried aboard a vessel fitted with this Separator at all times.

*) Nichtzutreffendes streichen
*) *Delete as appropriate*

Zulassungs-Nr. 330 218
Certificate-No.

Auferlegte Einschränkungen:
Limiting Conditions imposed:

Die Entöleranlage TMPB 10 darf nicht in explosionsgefährdeten Räumen aufgestellt werden und muss mit einer Exzenter-schneckenpumpe Type TSP 10 (10,0 m³/h bei ca. 269 U/min) oder einer Pumpe ausgerüstet werden, deren Kennlinie dem Durchfluß, Saug- und Druckverhältnissen obiger Pumpe entspricht, sowie einem Koalezer Typ TURBULO HEC und TURBULO HycaSep Elementen.

The oily water separator TMPB 10 is not permitted to be installed in space subject to explosion hazard and has to be equipped with an eccentric helical pump type TSP 10 (10,0 m³/h at appr. 269 rpm) or a pump with same speed-delivery characteristic curve as the above mentioned as well as a coalescer type TURBULO HEC and TURBULO HycaSep elements.

Bemerkungen:
Remarks:

Das Typenzulassungszeugnis für das o.g. System wird aufgrund der Erprobung der Entöleranlage Type TMPB 7,5 gemäß IMO-Entschließung MEPC.107(49) ausgestellt.

This certificate of type approval for the above mentioned system has been issued based on the test with the oily water separator type TMPB 7,5 in accordance with IMO-Resolution MEPC.107(49).

Dieses Typenzulassungszeugnis bleibt über das nachstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt.
Ein Widerruf für auf einem Schiff eingebaute Einrichtungen kann z.B. erfolgen, wenn diese nicht gefahren und/oder nicht gewartet und/oder nicht funktionsbereit sind und/oder nicht innerhalb einer angemessenen Frist an zukünftige Bestimmungen angepasst werden können.
This certificate of type approval is in force beyond the below mentioned date unless it is revoked.
A revocation of the equipment installed aboard the ship can follow, but is not limited to, if the equipment is not maintained and/or is not in good working order and/or the equipment can not be modified within an appropriate time frame, due to future regulatory standards.

Dieses Typenzulassungszeugnis ist gültig bis **31.07.2019**
This certificate of type approval is valid until

Daten und Ergebnisse der Erprobungen siehe Anhang.
Test data and results attached in the appendix.

Ausgestellt in Hamburg am **01.08.2014**
Issued at Hamburg on

(Siegel)
(Seal)

BERUFSGENOSSENSCHAFT FÜR TRANSPORT UND VERKEHRSWIRTSCHAFT
- DIENSTSTELLE SCHIFFSSICHERHEIT -

Unterschrift
Signature

Die Ölfilteranlage Serien-Nr. 62248 entspricht dem geprüften Typ.
The oil filtering equipment serial No. complies with the tested type.

Hamburg
Ort
Place

09.12.2015
Datum
date

Firmen-stempel
Company stamp

SKF Blohm + Voss Industries
20457 Hamburg
Hermann Blohm Strasse 5

Digital Sign
-F.Fischer-

Anhang zum Typenzulassungszeugnis für 15 ppm Ölfilteranlagen

Appendix to the certificate of the type approval of 15 ppm Bilge Separator

zu Type: TMPB 10

to type: TMPB 10

Typenbezeichnung der zugelassenen Anlage **TMPB 7,5**
Type of approved equipment

Daten und Ergebnisse der Erprobungen, durchgeführt an einer 15 ppm Ölfilteranlage gemäß Teil 1 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.107(49).
Test data and results of tests conducted on a 15 ppm Bilge Separator in accordance with part 1 of the annex to the Guidelines and Specifications contained in IMO Resolution MEPC.107(49).

15 ppm Ölfilteranlage zur Verfügung gestellt durch B + V Industrietechnik GmbH
15 ppm Bilge Separator submitted by

Ort der Erprobung B + V Industrietechnik GmbH, Hermann-Blohm-Str. 5, 20457 Hamburg
Test location

Verfahren der Probenanalyse IMO-Entschließung MEPC.107(49), Teil 4
Method of sample analysis *IMO-Resolution MEPC.107(49), part 4*

Analysen der Proben durch Dr. Wiertz-Dipl. Chem. Eggert-Dr. Jörissen GmbH, Stenzelring 14b, 21107 Hamburg
Samples analysed by Deutsche Shell GmbH, PAE-Labor, OGMF/1, Hohe-Schaar-Str. 36, 21107 Hamburg

Die Erprobung der elektrischen und elektronischen Geräte der 15 ppm Ölfilteranlage ist unter Umgebungsbedingungen gemäß Teil 3 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.107(49) durchgeführt worden. Die Anlage arbeitete bei Beendigung der jeweiligen Erprobung, die im Bericht über die Prüfung bei Umgebungsbedingungen festgelegt ist, zufriedenstellend.
Environmental testing of the electrical and electronic section of the 15 ppm Bilge Separator has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Empfehlungen und Informationen des Herstellers über den Gebrauch von Reinigungsmittel
Manufactures recommendations and information concerning the use of cleansing agents

Testflüssigkeit „A“
Test fluid “A”

Dichte *Density*	0,9878	kg/l bei 15°C *kg/l at 15°C*
Viskosität *Viscosity*	29	mm²/s bei 100°C *Centistokes at 100°C*
Flammpunkt *Flash point*	114	°C
Aschegehalt *Ash content*	0,02	%
Wassergehalt bei Versuchsbeginn *Water content at start of test*	0,01	%

Testflüssigkeit „B“
Test fluid “B”

Dichte *Density*	0,8453	kg/l bei 15°C *kg/l at 15°C*
Viskosität *Viscosity*	2,62	mm²/s bei 40°C *Centistokes at 40°C*
Flammpunkt *Flash point*	63	°C
Aschegehalt *Ash content*	<0,001	%
Wassergehalt bei Versuchsbeginn *Water content at start of test*	0,008	%

Testflüssigkeit „C“
Test fluid “C”

Tensid-dokumentierter Beweis *Surfactant-documentary evidence**	Surfactant	Sigma Aldrich Chemie GmbH, Product number 44200 Dodecylbenzenesulfonic Acid Sodium Salt
Eisenoxid-dokumentierter Beweis *Iron oxides-documentary evidence**	Iron oxides	Bayer, Bayferrox 318, Lot-Nr.: 7010586-131 CAS Nr.: 1317-61-9

Testwasser
Test water

Dichte *Density*	0,9984	kg/l bei 20°C *kg/l at 20°C*
Vorhandene Feststoffe *Solid mater present*	n.a.	mg/l

Testtemperaturen
Test temperatures

Umgebungstemperatur *Ambient*	23	°C
Testflüssigkeit „A“ *Test fluid “A”*	50	°C
Testflüssigkeit „B“ *Test fluid “B”*	23	°C
Testflüssigkeit „C“ *Test fluid “C”*	20	°C
Testwasser *Test water*	38	°C

Eine schematische Darstellung des Prüfstandes ist beigefügt.
Diagram of test rig attached.

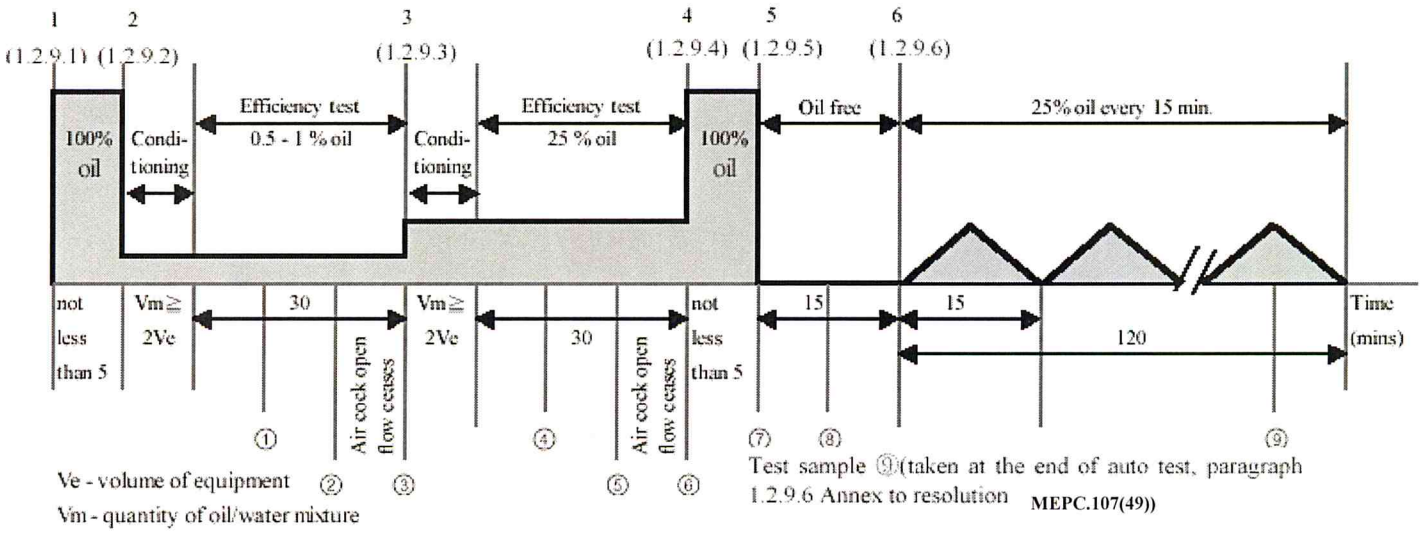
Eine schematische Darstellung der Probeentnahmestellen ist beigefügt.
Diagram of sampling arrangement attached.

* Zeugnis oder Laborauswertung
* *Certificate or laboratory analysis*

Versuchsergebnisse (mg/kg) und Prüfabläufe

Test Results (in ppm) and Test Procedures

Test Fluid A



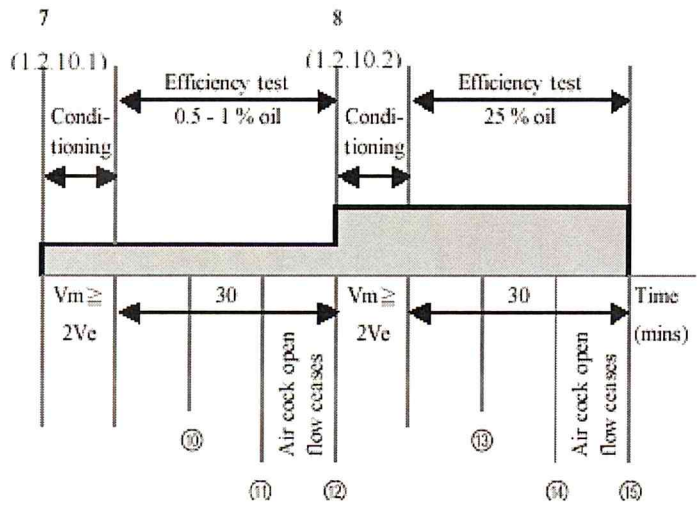
Ve - volume of equipment

Vm - quantity of oil/water mixture

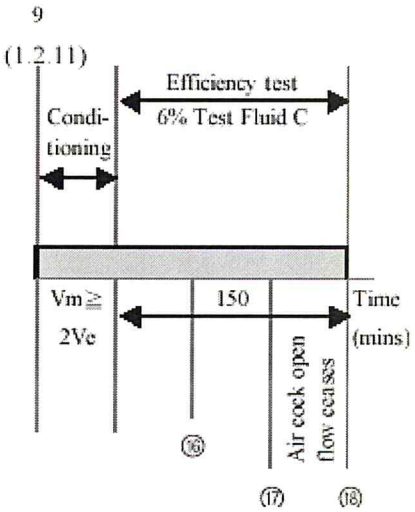
Test sample ⑨(taken at the end of auto test, paragraph 1.2.9.6 Annex to resolution MEPC.107(49))

	1	2	3	4	5	6	7	8	9
Influent	0,5-1	0,5-1	0,5-1	25	25	25	100	0	25
Effluent	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1

Test Fluid B



Test fluid C



	10	11	12	13	14	15
Influent	0,5-1	0,5-1	0,5-1	25	25	25
Effluent	1,1	1,1	1,1	1,1	1,1	1,1

16	17	18
6	6	6
1,1	1,1	1,1

1 – 9 steps refer to paragraph

(1) – (18) points where samples to be taken

Ausgestellt in Hamburg, am **01.08.2014**

Issued at Hamburg, on

(Siegel)
(Seal)

Berufsgenossenschaft für Transport und Verkehrswirtschaft
- Dienststelle Schiffssicherheit -

Unterschrift
Signature

European notified body
Identification number 0736

DGUV Test
Prüf- und Zertifizierungsstelle
BG Verkehr
Dienststelle Schiffssicherheit

EC-Type Examination (Module B) Certificate

Certificate-No. **330.218**

Name and address of the manufacturer:	SKF Blohm + Voss Industries GmbH; Hermann-Blohm-Str.5; 20457 Hamburg
Date of issue:	**01.08.2014**
Annex A.1 Item No & Item designation	**A.1/2.1 – Oil-filtering equipment (for an oil content of the effluent not exceeding 15 p.p.m.)**
Product designation:	Oily-water-separator
Product Type:	**TMPB 10**
Intended purpose:	Oily water separating equipment (15-ppm plant) for engine rooms on sea going vessels acc. MARPOL 73/78, Annex I
Testing based on (Specific standard):	IMO Resolution MEPC.107(49) for oil content meters and oily water separating equipment in acc. with MARPOL 73/78, Annex I
Remarks:	

The type tested was found to be in compliance with the Marine-pollution prevention requirements of Marine Equipment Directive (MED) 96/98/EC as amended by Directive 2012/32/EC subject to any conditions in the schedule (part of this certificate).

This certificate may only be used in connection with module(s) **D** of this directive.

Expiry date: **31.07.2019**

Berufsgenossenschaft für Transport und Verkehrswirtschaft 29

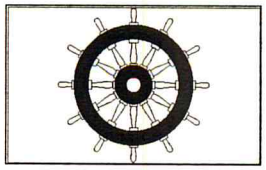
Signature (Seifert)

Installed equipment stays approved beyond the validity date until it is revoked!

Note 1: This certificate will not be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with the notified body named on this certificate.

Note 2: Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply.

Note 3: The Mark of Conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of ANNEX B of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.



xxxx/yy

Note 4: "Wheelmark" Format

YY Last two digits of year mark affixed.

XXXX Notified Body number undertaking surveillance module

Postal address:
Ottenser Hauptstraße 54
22765 Hamburg

Office:
Brandstwiete 1
20457 Hamburg

Tel: 0 40/3 61 37-0
Fax: 0 40/3 61 37 2 04
In any case, the German original shall prevail

Technical data/approved drawings and additional conditions and remarks:

The Prüf- und Zertifizierungsstelle of the BG Transport und Verkehrswirtschaft verifies and certifies the conformity of the above mentioned product in accordance with the Directive 96/98/EC of the Council as amended (last amendment by directive 2012/32/EC), Annex B, Module D or Module F (Product Verification), section 5, Statistical Verification.

OILY WATER SEPARATING EQUIPMENT SATISFACTORILY TESTED IN ACCORDANCE WITH THE TEST SPECIFICATION CONTAINED IN RESOLUTION MEPC.107(49) FOR AN EFFLUENT OF LESS THEN 15 ppm OF OIL

IMO-Nr.	Manufactured by	Type and Model	Maximum Throughput m^3/h	Integral Pump Fitted	Limiting Conditions Imposed (if any)	Approval		Standard Test Result Sheet held at IMO	Testing	
						Government	Date		Authority	Date
	SKF Blohm + Voss Industries GmbH Hermann-Blohm-Str. 5 20457 Hamburg	Turbulo Entöler TMPB 0,25 TMPB 0,5 TMPB 1 TMPB 2,5 TMPB 5 TMPB 10 TMPBH 0,25 TCS-MPB 0,25 TCS-MPB 0,5 TCS-MPB 1 TCS-MPB 2,5 TCS-MPB 5 TMPB 0,25/A TMPB 0,5/A TMPB 1/A TMPB 2,5/A TMPB 5/A TMPB 10/A	 0,25 0,5 1,0 2,5 5,0 10,0 0,25 0,25 0,5 1,0 2,5 5,0 0,25 0,5 1,0 2,5 5,0 10,0	Yes	no positioning in explosion area	Federal Republic of Germany	01.08.2014 01.04.2012	yes	See-Berufs-genossen-schaft	01.07.2004 15.06.2004 16.01.2007 05.02.2008 21.12.2007

TYPENZULASSUNGSZEUGNIS
für 15 ppm Bilge Alarm

Certificate of Type Approval for
15 ppm Bilge Alarm

Ausgestellt im Namen der Regierung der
BUNDESREPUBLIK DEUTSCHLAND
durch die BERUFSGENOSSENSCHAFT FÜR TRANSPORT UND VERKEHRSWIRTSCHAFT

Issued under the authority
of the Government of the FEDERAL REPUBLIC OF GERMANY
by Berufsgenossenschaft für Transport und Verkehrswirtschaft

Hiermit wird bescheinigt, dass der 15 ppm Bilge Alarm, die nachstehend aufgeführten Anlageteile umfasst, einer Prüfung unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in Teil 2 der Anlage zur Empfehlung der IMO-Entschließung MEPC.107(49) , erprobt wurde.
This is to certify that the 15 ppm Bilge Alarm, comprising the equipment listed below, has been examined and tested in accordance with the requirements of the specifications contained in part 2 of the annex to the Guidelines and Specifications contained in IMO-Resolution MEPC.107(49).

Dieses Zeugnis ist nur für nachstehendes Ölgehaltsmessgerät gültig.
This certificate is valid only for the 15 ppm Bilge Alarm referred to below.

15 ppm Bilge Alarm geliefert durch: **DECKMA HAMBURG GmbH, Kieler Straße 316, D-22525 Hamburg,**
15 ppm Bilge Alarm supplied by:

Typbezeichnung: **OMD 24**
under type and model designation and incorporating:

Die Analyse-Einheit des 15 ppm Bilge Alarms wurde hergestellt durch: DECKMA HAMBURG GmbH
15 ppm Bilge Alarm analysing unit manufactured by:

Zusammenstellungszeichnung Nr.: DH10810 Bl. 1 + Bl. 3 **Datum:** 09.12.2008;09.12.2008
to specification/assembly drawing No.: DH77500, DH79100 *date:* 09.12.2008;09.12.2008

Der elektronische Teil des 15 ppm Bilge Alarms wurde hergestellt durch: DECKMA HAMBURG GmbH
Electronic section of 15 ppm Bilge Alarm manufactured by:

Zusammenstellungszeichnung Nr.: DH10810 Bl. 1 + Bl. 3 **Datum:** 09.12.2008;09.12.2008
to specification/assembly drawing No.: DH77500, DH79100 *date:* 09.12.2008;09.12.2008

Versorgungspumpe hergestellt durch: --
Sample feed pump manufactured by:

Zusammenstellungszeichnung Nr.: -- **Datum:** --
to specification/assembly drawing No.: *date:*

Probenaufbereitungseinheit hergestellt durch: --
Sample conditioning unit manufactured by:

Zusammenstellungszeichnung Nr.: -- **Datum:** --
to specification/assembly drawing No.: *date:*

Der 15 ppm Bilge Alarm ist für die Verwendung gemäß Regel 16(5) geeignet.
The 15 ppm Bilge Alarm is acceptable for use in accordance with regulation 16(5).

Eine Kopie dieses Zeugnisses soll jederzeit auf jedem Schiff mitgeführt werden, das mit diesem 15 ppm Bilge Alarm ausgerüstet ist.
A copy of this Certificate should be carried aboard a vessel fitted with this 15 ppm Bilge Alarm at all times.

Dieses Typenzulassungszeugnis bleibt über das nachstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt. Ein Widerruf für auf einem Schiff eingebaute Einrichtungen kann z.B. erfolgen, wenn diese nicht gefahren und/oder nicht gewartet und/oder nicht funktionsbereit sind und/oder nicht innerhalb einer angemessenen Frist an zukünftige Bestimmungen angepasst werden können.
This certificate of type approval is in force beyond the below mentioned date unless it is revoked.
A revocation of the equipment installed aboard the ship can follow, but is not limited to, if the equipment is not maintained and/or is not in good working order and/or the equipment can not be modified within an appropriate time frame, due to future regulatory standards.

Daten und Ergebnisse der Erprobungen siehe Anhang.
Test data and results attached as Appendix.

Dieses Typenzulassungszeugnis ist gültig bis: **28.02.2019**
This certificate of type approval is valid until:

Ausgestellt in Hamburg am: 01.03.2014
Issued at Hamburg on:

BERUFSGENOSSENSCHAFT FÜR TRANSPORT UND VERKEHRSWIRTSCHAFT
- DIENSTSTELLE SCHIFFSSICHERHEIT -

Zulassungs-Nr.: 320 031
Certificate-No.:

(Siegel)
(Seal)

Berufsgenossenschaft für Transport und Verkehrswirtschaft 29

Seifert

Unterschrift
Signature

Anhang zum Typenzulassungszeugnis für 15 ppm Bilge Alarm

Appendix to the certificate of type approval for an 15 ppm Bilge Alarm

Daten und Ergebnisse der Erprobungen, durchgeführt an einem 15 ppm Bilge Alarm gemäß Teil 2 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.107(49).

Test data and results of tests conducted on a 15 ppm Bilge Alarm in accordance with Part 2 of the Annex to the guidelines and specifications contained in IMO-Resolution MEPC.107(49).

15 ppm Bilge Alarm vorgestellt durch:
15 ppm Bilge Alarm submitted by:
DECKMA HAMBURG GmbH

Ort der Erprobungen:
Test location:
DECKMA HAMBURG GmbH, Kieler Straße 316, D 22525 Hamburg,

Stelle, die die Prüfung durchgeführt hat:
Organization conducting the test:
See-Berufsgenossenschaft Hamburg

Verfahren der Probenanalysen:
Method of sample analysis:
IMO-Verfahren gemäß Entschließung MEPC.107(49) (ISO 9377-2)
IMO-method acc. to resolution MEPC.107(49) (ISO 9377-2)

Analysen der Proben durch:
Samples analysed by:
Institut Fresenius GmbH, Im Maisel 14, D-65232 Taunusstein-Neuhof

Die Erprobung des elektronischen Teils des 15 ppm Bilge Alarms ist unter Umweltbedingungen gemäß Teil 3 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.107(49) durchgeführt worden. Die Anlage arbeitete bei Beendigung der jeweiligen Erprobung, die im Bericht über die Prüfung bei Umgebungsbedingungen festgelegt ist, zufriedenstellend.

Environmental testing of the electronic section of the 15 ppm Bilge Alarm has been carried out in accordance with part 3 of the annex to the Guidelines and Specifications contained in IMO resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Empfehlungen und Informationen des Herstellers über den Gebrauch von Reinigungsmitteln.
Manufactures 'recommendations and information concerning the use of cleansing agents

Verwendung von schnell trennenden Reinigungsmitteln.

Detergents of quick separating type.

Der 15 ppm Bilge Alarm Serien-Nr.: 2007432 **entspricht dem geprüften Typ.**
The 15 ppm Bilge Alarm serial No.: *complies with the tested type.*

Hamburg	07.09.2015	**Firmen-stempel** -
Ort *Place*	**Datum** *date*	*Company stamp*

Blohm+Voss Industries GmbH
Hermann Blohm Strasse 5
20457 Hamburg
i.A. Frank Fischer

Europäisch notifizierte Stelle
Kennummer 0736

DGUV Test
Prüf- und Zertifizierungsstelle
BG Verkehr
Dienststelle Schiffssicherheit

EG-Baumusterprüfbescheinigung (Modul B)

Zulassungs-Nr. 320.031

Name und Adresse des Herstellers: DECKMA Hamburg GmbH, Kieler Straße 316, 22525 Hamburg, Germany

Ausstellungsdatum: **01.03.2014**

Nummer & Bezeichnung des Gegenstands: **A.1/2.3 – Ölgehaltsmessgeräte**

Produktbezeichnung: Öl-in-Wasser Monitor

Typ: **OMD 24**

Bestimmungsgemäße Verwendung: Ölgehaltsmeßgerät (15-ppm Alarm) für Entöleranlagen auf Seeschiffen gemäß MARPOL 73/78, Anlage I

Prüfgrundlage (spezieller Standard): IMO-Resolution MEPC.107(49) für Ölgehaltsmessgeräte und Entöler in Übereinstimmung mit MARPOL 73/78, Anlage I

Bemerkungen:

Das geprüfte Baumuster entspricht den einschlägigen Bestimmungen der Richtlinie 96/98/EG (Schiffsausrüstung) in der jeweils geltenden Fassung (zuletzt geändert durch die Richtlinie 2012/32/EG) vorbehaltlich der Auflagen im Anhang des Zertifikats.

Diese Bescheinigung darf nur in Verbindung mit Modul **F** dieser Richtlinie genutzt werden.

Diese Bescheinigung wird spätestens ungültig am: **28.02.2019**

Eingebaute Gegenstände bleiben bis auf Widerruf zugelassen über das Gültigkeitsdatum hinaus!

Bundesministerium für Verkehr, Bau und Stadtentwicklung – Bundesministerium für Transport und Verkehrswirtschaft

GUVTes

Unterschrift (Seifert)

Note 1: Dieses Zertifikat wird ungültig, wenn der Hersteller Änderungen oder Modifikationen jeglicher Art am zugelassenen Produkt durchgeführt hat, die nicht der benannten Stelle gemeldet und mit ihr abgestimmt wurden.

Note 2: Sollten spezielle Regeln oder Prüf-Standards für die o.g. Ausrüstung während der Gültigkeit des Zertifikates geändert werden, muss das Produkt neu getestet werden, bevor es nach Inkrafttreten der Änderungen an Bord geliefert wird.

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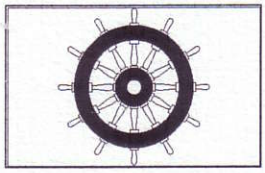

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Note 4: "Steuerrad" Format

YY Die letzten beiden Ziffern des Jahres, in dem das Konformitätskennzeichen angebracht wurde.

XXXX Nummer der benannten Stelle, die die Qualitätssicherung beim Hersteller überwacht.

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BG Verkehr
Dienststelle Schiffssicherheit
Ottenser Hauptstraße 54
22765 Hamburg

Hausadresse:
Brandstwiete 1
20457 Hamburg

Tel: 0 40/3 61 37-0
Fax: 0 40/3 61 37 2 04

Europäisch notifizierte Stelle
European notified body

Kenn-Nummer 0736
Identification number 0736

BG-Verkehr
- Dienststelle Schiffssicherheit -

Prüf- und Zertifizierungsstelle
im DGUV Test

Datum / *Date*: 17.09.2015

Konformitätsbescheinigung nach Modul F
Certificate of Conformity According to Module F

Bescheinigungs-Nr.: / *Certificate-No.:* **320.031**

Hersteller / Manufacturer:	**DECKMA HAMBURG GmbH**
Produkt/Product:	**Oil-in water monitor**
Typbezeichnung / Model designation:	**OMD 24**

Hiermit wird bescheinigt, daß das o.g. Produkt entsprechend Richtlinie 96/98/EG des Rates vom 20. Dezember 1996 über Schiffsausrüstungen, in der jeweils geltenden Fassung, einer statistischen Kontrolle nach Modul F unterzogen wurde und die unten aufgeführten Tests erfolgreich bestanden hat. Das vorgeschriebene Konformitätskennzeichen kann am Los (2007401 - 2007600) angebracht werden.

This is to certify, that the a.m. product has been tested in a statistical control according to module F and corresponds to Council Directive 96/98/EC of 20th December 1996 on Marine Equipment, as amended. The following tests have been carried out successfully. The required mark of conformity may be fitted for the next statistical lot (2007401 - 2007600).

Internationale Prüfnorm *International testing standard*	durchgeführte Prüfungen *Tests carried out*	Datum *Date*
MEPC.107(49)	Funktion tests, calibration, final checks	17.09.2015

Prüf- und Zertifizierungsstelle / *Testing and Certification Body*
i.A. */ by order*

(Seifert)

Postadresse: Ottenser Hauptstraße 54, 20404 Hamburg
Hausadresse: Brandstwiete 1, 20457 Hamburg
Telefon: 0 40/3 61 37-0
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DECKMA HAMBURG GmbH

DECKMA Decksmaschinen und Automation Vertriebsgesellschaft in Hamburg mbH

DECKMA HAMBURG GmbH ♦ Kieler Straße 316 ♦ 22525 Hamburg ♦ Germany

Works/Office/Delivery Address:
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Telefax: +49 (0)40 54 88 76 - 10
E-Mail: post@deckma.com
Internet: www.deckma.com

VAT-Registration No.: DE 118 540 659

TO WHOM IT MAY CONCERN

Your Ref.: Your letter dated: Our Ref.: Date: 24.08.2010

DECLARATION OF CONFORMITY

We, DECKMA HAMBURG GmbH,
declare under our own responsibility that the product

15 ppm Bilge Alarm, Type: OMD-24
manufactured by DECKMA HAMBURG GmbH
Kieler Strasse 316, 22525 Hamburg, Germany

complies with the Maritime Equipment Directive 96/98 EC, as amened by Directive 2008/67/EC.

The equipment has been tested to verify compliance with MEPC.107(49) as per Type Examination (Module B) Certificate No. 320.031 and related Certificate of Conformity According to Module F, Certificate No. 320.031.

DECKMA HAMBURG GmbH

ppa. Wolfgang Rathjen

DECKMA HAMBURG GmbH

SKF Blohm + Voss Industries
20457 Hamburg
Hermann Blohm Strasse 5

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Kieler Strasse 316
22525 Hamburg
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Tel.: +49 (0)40 548876-0
Fax: +49 (0)40 548876-10
eMail: pos t@deckma.com
Internet: www.deckma.com

Calibration Certificate No. 4009210

This is to certify, that the below described instrument has been tested and calibrated in accordance with the requirements of MEPC.107(49).

Equipment:	15 ppm Bilge Alarm
Type:	OMD-24/2005/2008, Measuring Cell
Serial No. Measuring Cell:	4009210
Value Master Instrument:	22 ppm
Value OMD-Measuring Cell:	22 ppm
Date of Calibration:	07.09.2015

Calibration is only necessary at one point >20 ppm as unit is linear between 0 ppm and 30 ppm.
Alarm Points are factory set to 15 ppm

DECKMA HAMBURG GmbH
Kieler Str. 316
D-22525 Hamburg
Germany

Electronic file. No signatures are required

Chapter 2

Text documents

2007432

07.09.2015

4009210

07.09.2015

22 ppm

22 ppm

62248

09.12.2015

Working documentation

Final Documentation
TURBULO Mechanical Phase Breaker
Type: TMPB-10
Shipyard: Daewoo Shipbuilding & Marine
Hull: 5425
SKF order no: 1158838
Imo: 9776547
Rev:1
Number of prints: 4

Print the IMO certificates and save it as a paper copy for Port State Control.

Operating manual for 15 ppm Separator

Type:TURBULO Mechanical Phase Breaker-MPB

Rev	1	
Pages	32	
Issued by	Jan Freitag	
Checked by	Frank Fischer	

Contents

1 Explanation of symbols and notes

This symbol will be found next to danger notes which indicate direct or indirect hazards to life and limb.
Grave or critical injuries may result if these notes are not followed. The 15 ppm bilge separator and/or surrounding items may be damaged or destroyed, as well.

This symbol will be found next to safety notes containing instructions or rules. Faults and malfunctions of the 15 ppm bilge separator may result if these notes are not followed. Damage to the seal and/or surrounding items may occur, as well.

This symbol will be found next to a note that contains special information on key functions, or special tips for use that help you to make optimum use of the 15 ppm bilge separator.

Turbulo

HEC = High Efficiency Coalescer

Turbulo MPB = Turbulo Mechanical Phase Breaker

HycaSep = Hydrocarbon Separator

are registered trademarks of the SKF Marine GmbH

The common name for the separator and the monitor is in accordance with MEPC.107(49)

15 ppm bilge separator

15 ppm bilge alarm

1.1 Definitions

1.1.1 Application and specified usage

The 15 ppm bilge separator is intended only for the stipulated application (e.g. bilge water deoiling) Any other or additional usage shall be considered not as specified.

The specified use includes also following the operating instructions and adhering to the inspection and maintenance conditions.

Usage not in accordance with specifications shall lead to the loss of all warranty rights.

1.2 Copyright

Address of the manufacturer

SKF Marine GmbH

Hermann-Blohm-Straße 5

20457 Hamburg

2 Safety

2.1 Operating range and specified application

The 15 ppm bilge separator is intended for the separation of oily water mixtures which are created within the machinery spaces according to MARPOL Annex I

2.2 Common notes on safety

The frame/skid of the 15 ppm bilge separator must be welded or bolted on the deck plates

Caution: Heater must be cold before dismantling.

Temperature control equipment for the steam heater is strongly recommended.

If a heater is installed the controller is to be adjusted to max 65 °C

For maintenance/repair work the respective safety measures must be adhered to.

Caution: Power to the OWS must be disconnected. The vessel must be depressurized.

Follow common safety rules for work on steam pipes.

The 15 ppm bilge separator must be ventilated if works are carried out inside of the separator vessel.

Oils and solvent containing stripped gases are harmful to lung/eyes/skin.

Wear protective clothing.

Clean skin areas which become contaminated and suitably protect them dependant upon skin type.

In accordance with MARPOL the discharged water has to be less than 15 ppm oil

Please note that the 15 ppm Bilge Alarm will record time, date, oil content > 15 ppm and separator status. Data will be ROM saved for 18 months.

a)Flushing of the 15 ppm Bilge Alarm will switch the 3/2 Sea Bilge valve to bilge.

Sigrist Oilguard has not this function !

b) Every access of the 15 ppm Bilge Alarm beyond the essential requirements of paragraph 4.2.8 (MEPC.107(49)) requires the breaking of a seal.

A vessel equipped with a 15 ppm Bilge Separator should have on board a copy of the Operating and Maintenance manuals at all times.

Ship staff training should include familiarization in the operation and maintenance of the equipment.

In case of a laboratory test, the determination of hydrocarbon has to be done in accordance to EN IS0 9377-2.

2.3 Safety equipment

The 15 ppm separator is equipped with safety valves.

The response pressure is engraved on the valve. The lid is secured against manipulation . Twisting the knob could be used for checking the spring.

The nominal throughput will be blown off at 10% above the adjusted pressure.

The closing pressure is 90% of the normal adjusted pressure

To indicate the pressure in the separator housing a pressure gauge is installed.

3 Important notes for new building installation

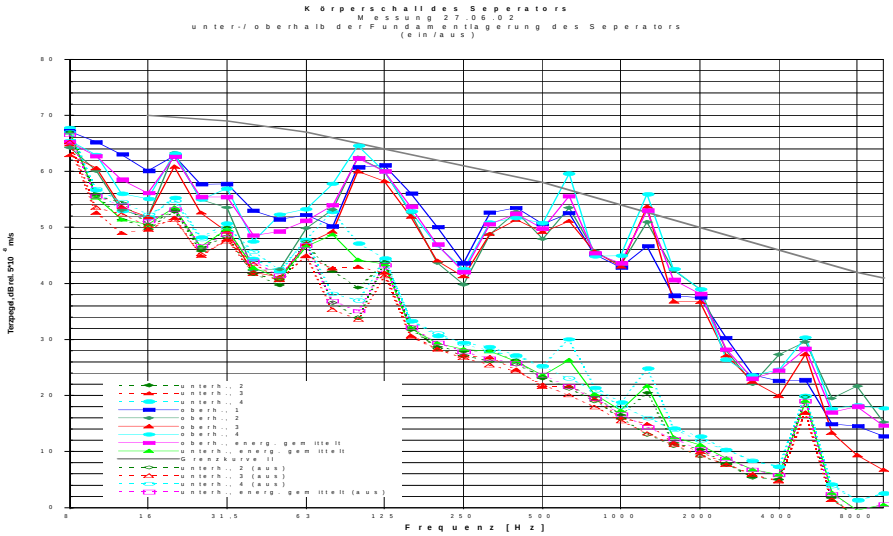
1) Let the separator stand as long as possible in a dry fitting environment.
2) Do not leave the separator wet and empty.
3) Clean the holding tank* before commissioning.
4) Keep in mind the holding tank* should be filled with fresh water
5) During piping and first operating flush the separator several times (2 times a week for 0.5 hr) to avoid a build up of scale, particles or rust etc.
6) In the separators first stage a "temporary filtration mat" is laid on the top of the coalescer (optional). It’s task is to collect dirt etc from the new building faze. The mat should be removed before real operation starts or the pressure safety valve will open. The separator bears a label if a mat is installed.

* Holding tank is an onboard installed tank for a sea going vessel buffering the bilge water.

These recommendations protect early clogging of the HycaSep elements during new building situation.

4 Airborne noise_ Structure borne _Shock _Vibration_electromagnetic compatibility

4.1 Structure borne noise



The real structure borne noise can be investigated on the final equipment if required

The airborne noise is less then 70 dB(A) in a distance of 1 m

4.2 Shock

Shock requirements can be checked in individual cases

4.3 Vibration/climate

The switchbox is approved in accordance to IEC 60068-2-1-2-3-6

4.4 Electromagnetic compatibility

The equipment fulfills IEC 10004-4-2 IEC 1000-4-2; ENV501

5 Description of functions

5.1 Description

The TURBULO Mechanical Phase Breaker is a gravity – coalescence separator, i.e. by using the difference in density and the surface tension between oil and water as well as the coalescing processes, the oil from the bilge is removed in a two-stage process namely in the HEC housing (100) and in the HycaSep housing (200)

The oil-water mixture is pumped into the pre-separation stage which is in the upper part of the HEC housing where virtually all of the oil is retained.
The separation, i.e. the removal of small and finest oil droplets takes place in the so-called High Efficiency Coalescer.(HEC ;125) The coalescer material does not absorb water and oil. However the oil is attracted to the oleophilic surface, forming droplets which grow until they float. The coalescer is characterised by an open pore sponge structure with a very large surface area and very low pressure loss. The coalescer is adequately stable against matter which is found in bilge water. The dirt in bilge water is not detrimental to the coalescer. Even with considerable fouling, coalescer replacement is not normally required.

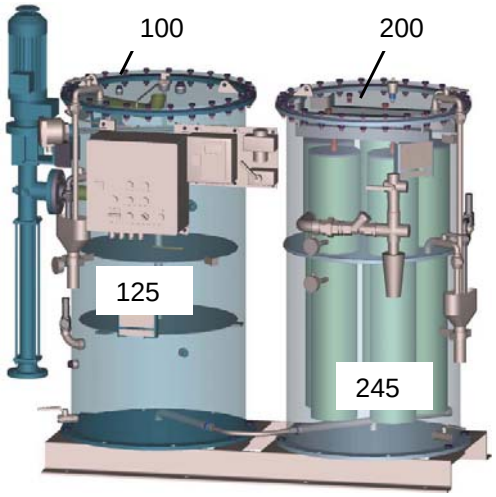


Fig 5-1: Cross section

Following separation in the HEC coalescer water with very low oil content is passed to the HycaSep housing (200). The oil droplets with the finest diameters will be separated in the HycaSep elements (upper/lower) (245).The HycaSep elements work on the principle of coalescence. The treated water leaves the housing via the sea bilge valve and the oil content of the discharged water is measured by the 15 ppm bilge alarm.

6 Transport

6.1 Special safety requirements

The 15 ppm bilge separator is equipped with lifting eyes. The precise center of gravity is marked on the drawing. Lifting eyes/lugs are in accordance with DIN 82024-1.
[The allowable force between 40° and 80° is 10.000 N/lug .TMPB 5 has 4 lugs. Weight of separator is 1000 kg. A 4 times safety is available]

The 15 ppm bilge separator is standard packed (H). Optional spare parts/ are packed separately in a carton.

6.2 Incoming goods control

The 15 ppm bilge separator as well as the accessories are to be checked in accordance with the packing list.

6.3 Requirements for the transport

Impact stress and rough handling are to be avoided as the 15 ppm bilge separator is a measuring instrument, the 15 ppm bilge separator is not to be exposed to the full sun.

6.4 Ware house conditions

Frost-.proof, Humidity < 65%, Tmax 50°C

However pump, 15 ppm bilge alarm and housing have to be drained.

If it is likely that the HycaSep elements may be subjected to frost, their removal should be considered.

7 Installation

The 15 ppm bilge separator is delivered as a plant ready for installation.

Consider the important overall dimensions on the drawing.

The viscosity and the pressure loss in the suction line have to be considered.

Domestic water is required for filling up the oil separator and for zero adjustment of the 15 ppm bilge alarm.

a) The space for dismounting of the heater must be taken into consideration.
b) The oil discharge line should be arranged sloping down
c) Earthing connections are to be fitted to the OWS, if required.
d) Front access for servicing must be ensured.
e) The maximum suction height is 6 m.
f) The total differential pressure of the pump is approx. 39 m (100% throughput)
g) There should be no needless reduction of the cross section in the suction pipe and no installation of spring loaded valves etc.
h)The housings have a limited overpressure of 2.5 bar /3.5 bar on demand.
(The TMBP housings are pressure vessels and will be secured by a PSV, 2.5 or 3.5 bar depending on the operation requirements)
i)The useable pressure difference in the HycaSep elements is approx 1.5 bar
j) New HycaSep elements have a pressure loss of 0.1bar
k)For economical operating of the HycaSep elements, the full useable pressure difference should be exploited.

Information:

The housings are designed as pressure vessels. The calculation was verified by a classification society. Cover flange seals are made out of elastomer. Bolts and flanges are calculated according to AD-guidelines

The inner coating is a two component epoxy alkyd system, color grey or black.

[Option]

The booster pump skid can be lifted with the lifting lugs on the cover of the tank

The mounting of the basis to be executed with four (4) bolts and nuts to an existing frame.

The coating is not a tar - epoxy

8 Commissioning_Prestart

Item Installation	Y	N
All parts free from damage		
Compressed air supply connected to solenoid valves		
Domestic water supply connected for dry running protection, and zero adjustment of monitor (portable water)		
All connected pipes checked for tightness		
Suction line connected and checked for tightness		
Separator filled up with water and second stage vented		
Pump seal/stuffing box packing fitted		
Protecting plastic stud of the gear removed from gear of the pump		
Suction line- open relevant valves		
Item Electric		
Cables and their connections free of damage?		
Mains supply to switch box connected?		
Item* function *check		
Activating the plant: Turn switch S1 from 0 to 1: Signal lamp “POWER ON” lights up (white)		
Starting the Pump: Press push-button S3 “PUMP ON” : Signal lamp HS3 “PUMP 0N” lights up (green)		
Manual oil discharge: Press push-button S4 “OIL OUTLET MANUAL” : Signal lamp H4 “OIL OUTLET” lights up (red) Oil discharge valve opened		
Pump rotates in direction of arrow		
Pressure gauge indicates a pressure > 0.3 bar		
For simulating the alarm conditions switch to fresh water. Sigrist Oilguard need the special kit, which is in the supply. See also Sigrist manual		

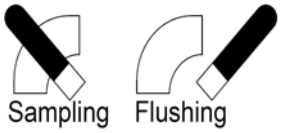
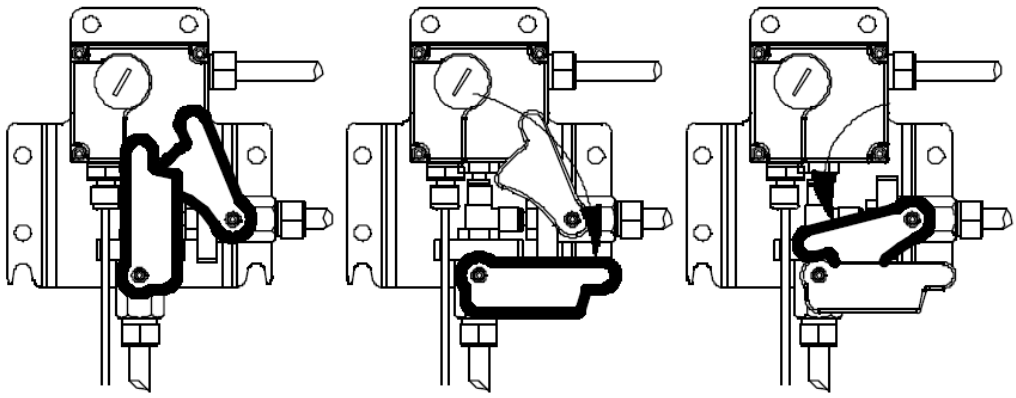
Item: 15 ppm bilge alarm	Y	N
The 15 ppm bilge alarm is adjusted to 0 ppm, if potable water flow Not valid for Sigrist Oilguard		
During 15 ppm alarm the monitor switched the sea/bilge valve?		
Check that water flows from the monitor to the funnel		
Lever of OMD 2005  Operating Testing		
Lever of OMD 24 _Manual Valve  		
The electric flushing valve for **OMD 24 or 2008** will be initialed from the computer part of the monitor or optional from the		
Item Separator		
Heater on / Valves opened (in case of steam)		
Normal /Emergency stop: Switch off and close valves in the suction line		

Table 8-1: Commissioning

9 Checking the 15 ppm bilge alarm

Due to the different monitors which may be installed on a bilge water separator, please read the specific information in the manual on the 15 ppm Bilge Alarm.

10 Operating

10.1 Special tools

No special tools required

10.2 System requirements

Air pressure 6 bar, negligible amount

Domestic water > 1 bar; 3-5% of the throughput of the 15 ppm bilge separator

10.3 Limitations

Suction high max 0.6 bar. Pressure head of the pump 3.3 bar

Delta p = 3.9 bar (100% throughput) for the pump.

If the pump draws against a higher counter pressure the throughput is reduced. For example if the counter pressure is 4 bar then the throughput will be 92%.

Voltage tolerance +/- 10 %

The temperature in the separator should not exceed > 60°C.

Holding tank* temperatures up to ~45 °C. * Holding tank is an onboard istalled buffering tank for bilge water. Normal installed on seagoing vessels.

Useable delta p for the elements ~ 1.5 bar.

10.4 Start up

The plant may only be started when there is water in the bilge well, the bilge water holding tank and the separator has been filled with water.

Normal operating

Heating

Normally the separator is fitted with electric heating. The heater is not used for heating up the mixture to be separated, but for reducing the viscosity of the already separated oil in the upper section of the separator. If heavy fuel is used a heated bilge water holding tank is recommended.

Automatic oil discharge

A probe monitors the oil level in the separator. The length of the probe's electrode determines the operating range. Whilst the oil is being discharged, the pump is running.

Manually oil discharge

Push button, "Manual oil discharge", to drain oil to the waste oil tank.

After starting, open shortly valve position 210 to check whether housing two is filled.

10.5 Cold cleaner

To assess the separation of oil and cold solvent cleaner mixtures, a number of cold solvent cleaners have been tested in the separator.

Under practical aspects it is not possible to evaluated cleaners.

Helpful information for the selection of cold cleaners

a) Should be based on organic solvents – not water based

b) The amount of detergent should be low (max 5%)

c) Anionic detergent in the cleaner recommended

d) The product should have low or no amount of aromatics

e) No SiO_X

f) No EDTA

Quick separating cleaners are not really in the market.

10.6 Sampling

To determine the purity of the de-oiled water, samples can be taken at the 15 ppm bilge alarm pipe to the funnel (Pos. 230) Then, the sample has to be sealed airtight. It is useful for laboratory analysis, to take also a sample of the bilge water. For sampling purposes, the use of 1-liter glass bottles is recommended.
If a laboratory is used, the following items should be tested:

pH:	
Solid content:	mg/l
Free and dissolved oil content:	mg/l (ppm)
Anionic tensides content:	mg/l
Cationic tensides content:	mg/l
Measuring method:	GC ISO 9377-2

General recommendations for the operating

Onboard service recommendations

a) The number of cold cleaners to be minimised
b) Only suitable bilge water pumps to be used
c) Bilge water holding tank temperatures < 45 deg C
d) Install suction pipe at an appropriate height in the collection tank
e) No sludge to be discharged into the bilge water holding tank
f) When the oil content alarm lights up on the monitor, the plant should be stopped after a suitable period.
g) Bilge water to be removed from the collection tank quickly
h) A bilge water disposal management system to be set up

Please consider attached note “Oil mixtures and dirt”

11 Break downs and their possible causes

Breakdowns	Cause	Remedy	Pos
The plant is on, but it does not start	Pushbutton S2 "pump on", not pushed or faulty F5 activated	Push S2 or exchange Check motor	500 600
The plant starts up, but pressure is not generated	Pump malfunction Pump rotating wrong direction	Check direction of pump See pump faults	600
The oil is not being discharged, although the maximum oil level has been reached and the oil discharge valve indicator lamp is on.	a) Pilot valve does not work b)Oil discharge valve does not work c) Additional valves closed d)Viscosity of oil to high f)Heater not active	a)Check accessibility of air and voltage b)Exchange or clean, check direction of flow c)Open valves d) Switch on the heater or repair , defective heater to be exchanged	
The integrated heater does not warm up the oil	a)Fuses are defective b)No steam c)The thermo contactor activated d)Oil throughput to high	a)Check for a possible short circuit, check fuses b)Check Condensate trap if installed c) Press button in the heater switch unit. d)Reduce oil throughput ,by means batch operating	500
The monitor indicates increased values	Desiccant cartridge consumed	Exchange or dry the desiccant cartridge .See monitor faults	400
The sea / bilge valve discharges only into the bilge	a)Pilot valve does not function b)Air supply interrupted c)Valve sticks d)Discharge valve closed e)Remaining oil content > 15 ppm f)Piping wrong	a)Check accessibility of air, check for burned coil, piping, voltage, exchange the valve if it is defective; b)Check accessibility of air c)Exchange possible broken spring d)Open it e) B+V service f)Check flow direction	
High pressure loss at elements	Elements are clogged	Exchange elements	
The ppm value is high after elements were changed	Elements damaged or not correctly fitted	Check elements of intact state See Exchange of HycaSep	
Chemical analysis shows the oil content to high.	Faulty Analysis Cleaner components too high Other Emulsions	a)Measure free hydrocarbons at a lab b)Correct wrong cleaners, reduce concentration of wrong cleaners, e.g. emulsifying cleaner chemicals agents c)Correct process management	B+V

Table 11-1: Break downs

12 Maintenance

12.1 Maintenance intervals

Weekly	
15 ppm bilge alarm	Glass cell-tube to be cleaned internally by using the bottle brush supplied. Oil monitor to be flushed with clean water. The desiccator colour to be checked: If the colour is light blue or white, the desiccant cartridge should be replaced." **Not valid for Sigrist Oilguard**
Monthly	
Switchbox	Check the electric function. The safety rules are to be considered.
Pump	The gland of pump shaft to be inspected. If there is a leakage of more than 10 drops per min., then soft packings have to be tightened carefully (below this limit nothing has to be done).
HycaSep housing	Check separated oil level in the HycaSep Housing (210/220)
Annually	
Separator housing	To be cleaned internally. Coating to be checked for intact physical condition, if defective, it shall be repaired to prevent severe corrosion. See also Repair of coating
	5 yearly (During IOPP) 2.5 yearly (some class notations)
15 ppm bilge alarm	Calibration (from manufacturer or authorized personal)

Table 12-1: Maintenance interval

12.2 Maintenance operation

Dismantling the HEC coalescer

Manual oil discharge: Switch on the heater to warm up separated oil.

Let the pump run. Switch manual Oil discharge open to drain the remaining oil.

Stop the pump. Let the heater cool down. Switch off power supply.

Close the valve - then switch 3/2 valve in the connection pipe between the housings to drain. Drain the water out of HEC housing.

Dismantle the heater and probe. Dismantle the cover. Dismantle the oil discharge pipe (850) and inlet distributor (820) .

Loosen of the eye-bolt (801) and take out inlet distributor (820).

Screw the eye-bolt in again (801). Use a strap and slide out the coalescer tray (826). Loosen lever (825) and remove the whole plate to take out the coalescer inserts.

Internal parts of the separator housing can be cleaned with warm water up to 60 °C

For cleaning the coalescer see chapter 16.

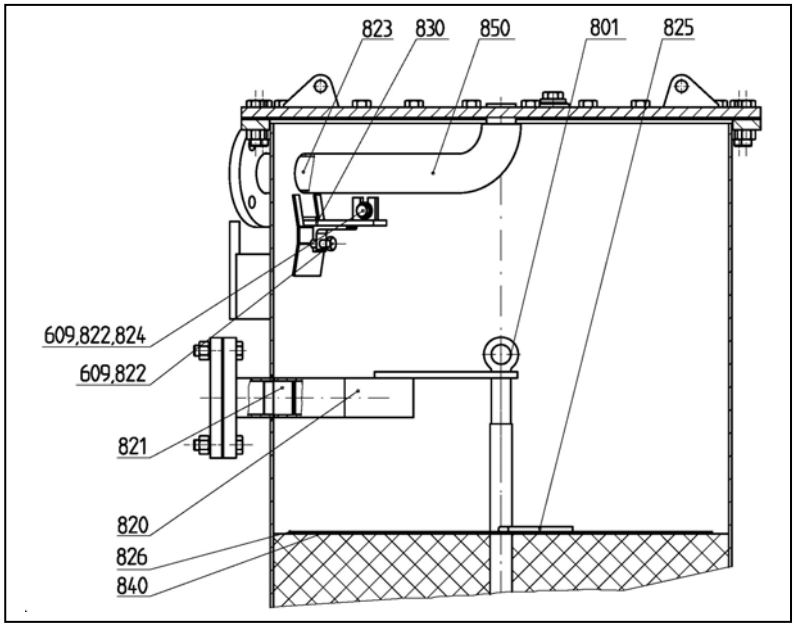


Fig 12-1: Internal parts of the HEC housing

12.2.1 Cleaning of the _HEC

The cleaning of the coalescer is described in chapter 15

12.2.2 Exchange of the HycaSep elements

HycaSep elements must changed if the pressure loss is higher ~1.5 bar. HycaSep elements cannot be cleaned. Lower part – deep filtration unit – could be exchanged separately.

Any remaining oil has to be drained via the cocks. Run the pump.

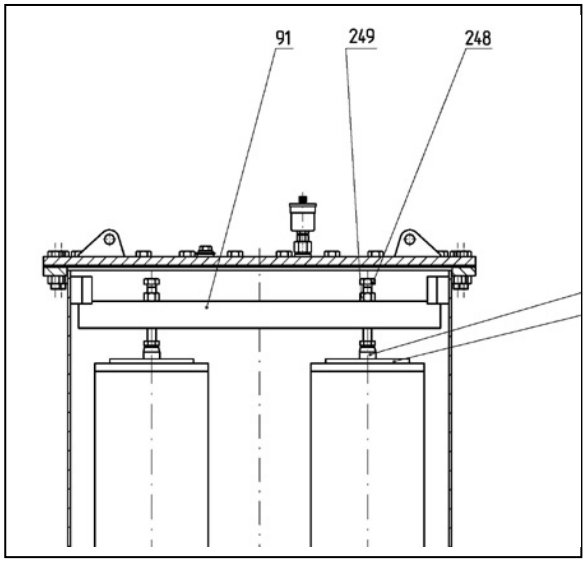
When water comes out of the cocks stop the pump. Switch off the power supply.

Close the valve in the connection pipe - then switch 3/2 valve between the housings to drain.

Drain the HycaSep housing. Let the elements drain. Wet elements have a weight of approx. 18 kg. If split element is used, the weight is less.

Loosen screws (248) and withdraw the elements with a strap.

Lubricate the thread of the bolts again with copper paste after inserting the elements to avoid sticking.



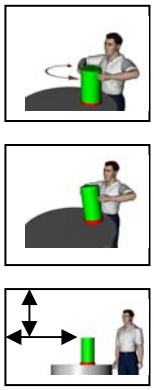


Fig 12-2: Cross section of the upper part of the HycaSep housing

12.2.3 Lubrication

See lubrication in the pump manual. No further lubrications necessary.

12.3 Disposal

Oily disposals are to be handled according to MARPOL V

HycaSep elements can be burned or must be disposed in accordance with local regulations.

12.4 Repair

12.4 Coating repair inside

Hempel HB 4520/1999 Coating or similar
Hempel: Thinner 0845/

12.5 Valves

The valves are designed for a long lifetime. It is in general not worthwhile to repair these valves. Therefore repair kits are not offered.

Safety valves should be sealed and should not repaired.

12.6 Pump

For maintenance and repair of the pump see pump manual.

12.7 Elements

The HycaSep elements to be inserted dry.

Wet elements should not dry out

The seal areas to be checked for cleanliness. The torque should be 40 Nm.

Pos 248 Fig 17-2

13 Spares

13.1 To class

Depending on class societies spare parts may not be required.

If spare parts are supplied, they are listed separately.

14 Oil mixtures and dirt

Dirt and real emulsions are the main problem for the separation.

This chapter tries to describe the problem in a very short form.

Cleansers contain substances, e.g. detergent to dissolve dirt and oils from surfaces. Oil droplets are then charged electrochemically.

As a consequence, the oil droplets cannot merge. The result is in informal language an emulsion.

There are many types of emulsions and it is difficult to characterize them

The separation of a real emulsion is difficult.

As a rule dirt carries oil attached to its surface.

This dirt can influence the lifetime of the HycaSep elements.

To reduce solid matter concentration it is helpful to use a bilge water holding tank.

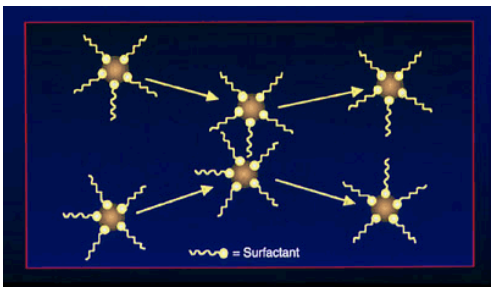


Fig 14-1: Oil droplets with surrounding detergents

As monitoring systems are more sensitive than in the past and detect more solid matter and turbidities etc, manufactures are in somewhat of a dilemma for if their elements were more open to solid matter and oil, it is unlikely that they could secure the 15 ppm to pass the international MEPC test.
The new rules have forced crews to consider avoiding sludge particles, solid matter etc. entering the bilge water which will be drawn into the separator.
It is well know, that these circumstances are unsatisfactory, but it is the MEPC's intention is to protect the environment. It is obvious that this can lead to conflict on both sides from the manufacturer and the operators.

15 Cleaning of the HEC

For all works described below it is important that the valid safety regulations are adhered to.

1. Turn on heating for at least 2 hours.
2. Discharge the oil, keep push button pressed for at least 3 minutes.
3. Switch off main power switch.
4. Drain water via drain cock (Pos 270)
5. Let the coalescer drain itself inside the vessel, 2 to 3 hours should be allowed for this.
6. Remove cable of the electrode and remove it completely from the top cover, dismount electrode (head width 46 mm).
7. Remove screw joint of the top cover and remove the top cover with suitable lifting device (consider the weight).Do not damage the seal.
8. Ensure that the heating has cooled down. Where plants are equipped with steam heating, the steam heating has to be put out of operation. If necessary, dismount electric heater and/or steam heating (M 20, head width 30 mm, electric heating can also be dismounted directly, head width 65 mm. Before dismounting the steam heating, make sure the steam pipes are pressure free).
   Follow common safety rules for work on steam pipes.
9. The total weight depends on the quantity and the kind of oil and water remaining.
11. The coalescer can be cleaned with a steam pressure cleaner at a maximum water temperature of 100 grd C. The vessel can be cleaned with warm water at a maximum temperature of 65 grd C.
12. For correct mounting of the coalescer, the upper parts are to be inserted twisted by 90 degrees to the lower parts (valid for 10 m^3/h)
13. Assembly of the separator has to take place in the reverse order of dismounting,
    Start the plant in accordance with operation manual

16 Rules

The important rules/guidelines for 15 ppm bilge separator are the

Helcom Recommendations 24/6

MEPC.107(49)

MEPC. 235 and the IBTS

Memorandum Of Understanding of Ports State Control

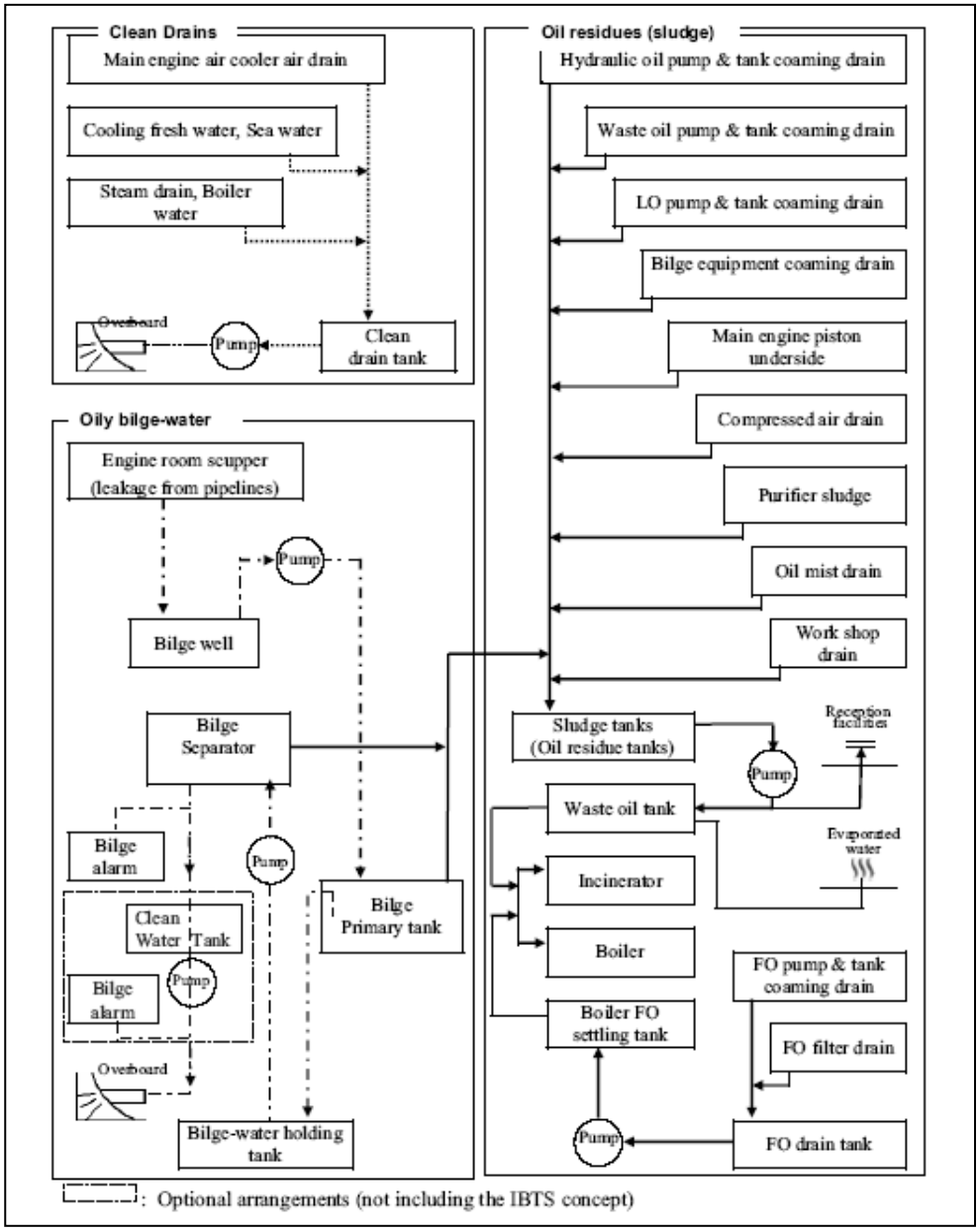
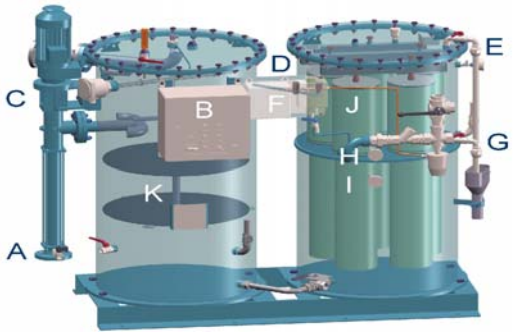


Fig 16-1: IBTS

17 Instruction label



Instructions for TMPB
15 ppm bilge separator according to MEPC.107(49)

This label complies to MEPC.107(49)
Item 6.1.3

Start of TMPB	Notes/ Recommendations
Open valves for suction/discharge pipe	
Open valve for compressed air	For valves in (Pos D)
Open valve for domestic water	Dry running protecting (Pos A)
Open valve checking the filling status	Second stage should be filled (Pos E)
Turn "Power on" , Turn “Pump Run”	(Pos B)
Check the rotation direction of pump	(Pos C)
Stop of TMPB	
Turn “ Pump Off”, Turn "Power off"	
Close valve for domestic water	For valves in (Pos D)
Close valve checking the filling status	Dry running protecting (Pos A)
Close valves for suction/discharge pipe	Avoid emptying of vessels
Maintenance	
Check the monitor/desiccant cartridges weekly	(Pos F)
Drain oil monthly.	(Pos E / G) Pump is running
Elements to be changed if gauges show a pressure loss of ~ 1.4 bar, or safety valves opens depending on clogged element.	Pos (J ; H / I)
Coalescer is to be cleaned annually	K
Safety valve(s) open/ cose +/- 10% Rotate the knurl for checking the spring.	According to the rule
Limitations: Suction pressure 0.6 bar Safety valve 3.5(2.5) bar [3.5 or 2.5 bar depending installation requirements] Max temperature 60 °C inside of separator	Chemicals/soot/ microbiological fouling can influence the separation effect. Avoid dirty sludge to bilge
	Operating manual must be all times available. (MEPC.107(49))
	Bilge alarm records date, time, ppm and separator status.
	All routine and repair maintenance to be recorded.
Sample laboratory analysis method	GC 9377-2

Discharge of oil prohibited !

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of contiguous zones, or which may affect natural resources belonging to, appertaining to, under exclusive management of the United States, if such discharge causes a film or discoloration of the surface of the water or cause a sludge or emulsion beneath the surface of the water. Violators are subject to substantial civil penalties and /or criminal sanctions including fines and imprisonment.

18 Drawing_cross sections

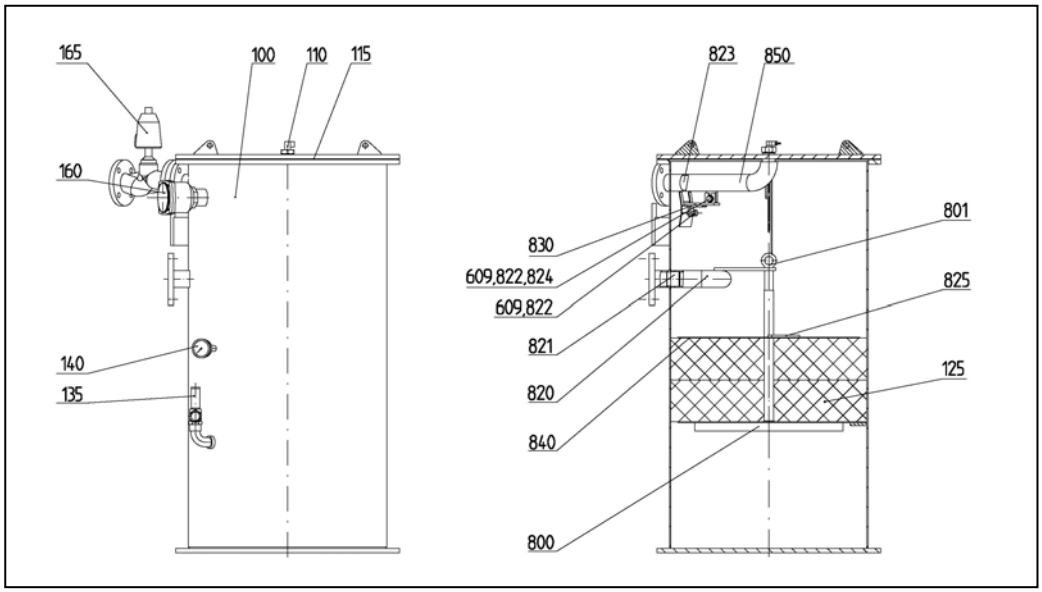


Fig 17-1: Cross section of the HEC housing (First stage)

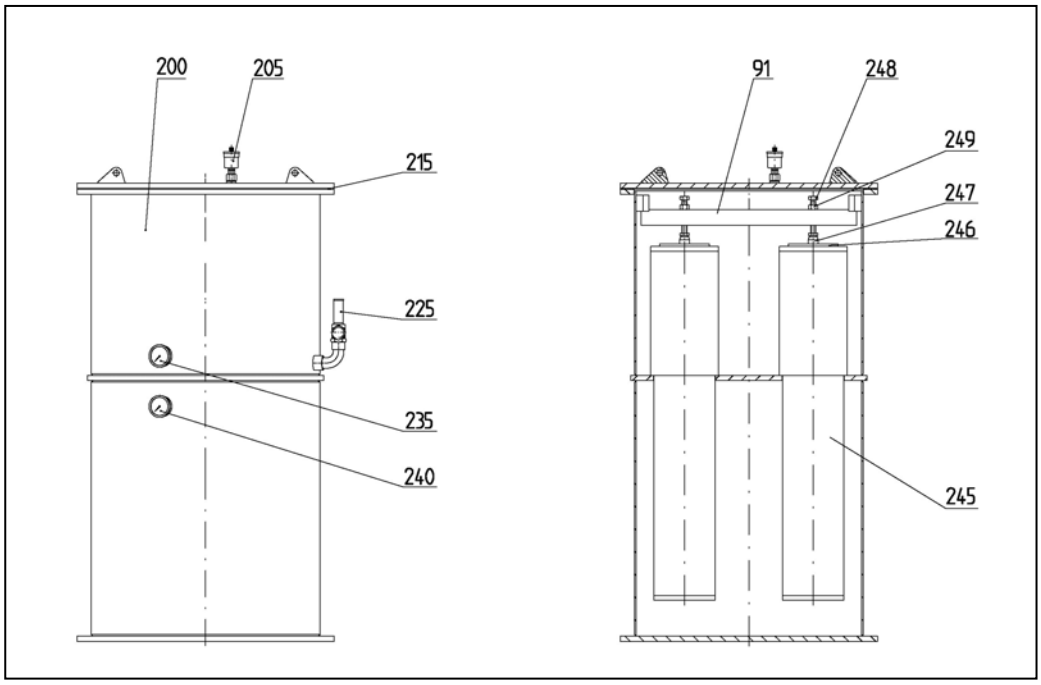


Fig 17-2: Cross section of the HycaSep housing (Second stage)

HEC housing			
Pos		Bezeichnung	Name
100	1	Entölergehäuse,1.Stufe	Separatorhousing,1.stage
110	1	Ölstanssonde	Probe for oil level
115	1	Deckeldichtung	Cover sealing
125	1	Coalescer	Koaleszer
135	1	Sicherheitsventil	Safety valve
140	1	Manometer	Pressure gauge
160	1	Einschraubheizkörper	Electric heating
160		Dampf-Heizung	Steam heater
165	1	Ölablaßventil	Oil discharge valve
609	1	Sechskantmutter	Hexagon nut
800	1	Aufnahme	Supporting
801	1	Ringschraube	Eye-bolt
820	1	Eintrittsrohr	Inlet pipe
821	1	Kunststoffbuchse	Plastic bush
822	2	Sechskantschraube	Hexagon screw
823	1	Kunststoffbuchse	Plastic bush
824	1	Scheibe	Washer
825	1	Haltestift	Stop pin
830	1	Halterung	Mounting bracket
840	1	Oberes Lochblech	Upper perforated plate
850	1	Öl-Austrittsrohr	Oil-outlet pipe

Table 17-1: Positions of Fig 17-1

HycaSep Housing			
Pos		Bezeichnung	Name
91	1-5	Querträger	Cross bar
200	1	HycaSep Gehäuse	HycaSep Housing
205	1	Entlüftungsventil	Vent valve
215	1	Deckeldichtung	Cover sealing
225	1	Sicherheitsventil	Safety valve
235	1	Manometer	Pressure gauge
240	1	Manometer	Pressure gauge
245	1-9*	Top element: HycaSep Top element: HycaSep	Lower: Deep filtration unit Unten: Tiefenfiltereinheit
246	1-9*	Abschlußsegment	End cover
247	1-9*	Gelenkfuß	Levelling feet
248	1-9*	Sechskantschraube	Hexagon screw
249	1-9*	Sechskantmutter	Hexagon nut
* Depending on size			

Table 17-2: Positions of Fig 17-2

19 Contact

Department	Short	Name	Phone	Fax	X.Y@skf-marine.com
			49 40 3011-	49 40 3011-	
Sales	S11	Guss	1560	1950	Paul.Guss
		Dettmer	2462		Joern.Dettmer
		Hawer	1392		Uwe.Hawer
		Schmidtke	1582		KarlHeinz.Schmidtke
		Langfeldt	1573		Jan-Christian.Langfeldt
		Behrend	Jens-Olaf		Jens–Olaf.Behrend
Service	S241	Freitag	1279	1942	Jan.Freitag
Spares	S43	Mrs. Oldörp	2967	1937	Martina.Oldoerp
		Scharff	1869		Matthias.Scharff
		Wiese	1209		Frank.Wiese
Order Processing	S42	Plaass	1152	1969	Helmut.Plaass
		Sturm	1469		Eike.Sturm
Design	S41	Behnke	2263		Karsten.Behnke
		Lang			Torsten.Lang
Technique	S40	Fischer	2261		Frank.Fischer

Europäisch notifizierte Stelle
European notified body

Kenn-Nummer 0736
Identification number 0736

See-Berufsgenossenschaft

Prüf- und Zertifizierungsstelle
im BG-PRÜFZERT

Datum / *Date*: 31.03.2006

Konformitätsbescheinigung nach Modul F

Certificate of Conformity According to Module F

Bescheinigungs-Nr.: / *Certificate-No.:* **320.028**

Hersteller / Manufacturer:	**DECKMA HAMBURG GmbH**
Produkt/Product:	**Oil-in water monitor**
Typbezeichnung / Model designation:	**OMD 2005**

Hiermit wird bescheinigt, daß das o.g. Produkt entsprechend Richtlinie 96/98/EG des Rates vom 20. Dezember 1996 über Schiffsausrüstungen, in der jeweils geltenden Fassung, einer statistischen Kontrolle nach Modul F unterzogen wurde und die unten aufgeführten Tests erfolgreich bestanden hat. Das vorgeschriebene Konformitätskennzeichen kann am Los (1003401 - 1003600) angebracht werden.

This is to certify, that the a.m. product has been tested in a statistical control according to module F and corresponds to Council Directive 96/98/EC of 20th December 1996 on Marine Equipment, as amended. The following tests have been carried out successfully. The required mark of conformity may be fitted for the next statistical lot (1003401 - 1003600).

Internationale Prüfnorm *International testing standard*	durchgeführte Prüfungen *Tests carried out*	Datum *Date*
MEPC.107(49)	Funktion tests, calibration, final checks	31.03.2006

Prüf- und Zertifizierungsstelle / *Testing and Certification Body*
i.A. */ by order*

(Seifert)

Postadresse: Postfach 11 04 89, 20404 Hamburg
Hausadresse: Reimerstwiete 2, 20457 Hamburg
Telefon: 0 40/3 61 37-0
Telefax: 0 40/3 61 37-2 04

Operating manual
15 ppm bilge alarm
Type OMD – 24_EV

Rev	1
Pages	25
Issued by	Jan Freitag
Checked by	Frank Fischer

Changes into this manual can be made without prior notice.

IMPORTANT NOTICE

Replacement components for 15ppm Bilge Alarms.

General

All monitors in our range are inspected and tested to the related I.M.O. requirements at our factories prior to delivery.

In normal use the units should operate correctly and without fault over a long period of time requiring only small amounts of maintenance to be carried out as outlined in the instruction manuals.

Service Exchange Units

In the event of a monitor malfunction due to electrical or electronic component failure it is our recommendation that a service exchange unit be ordered.

The defective instrument should be returned to our works within 30 days of supplying the service exchange unit, then only the repair charge is payable. Otherwise the whole cost of a service exchange unit becomes payable.

This procedure is by far the easiest and most cost effective way of ensuring the monitor on board conforms to I.M.O. resolution MEPC.107 (49).

Remark:

According the MEPC.107(49) § 4.2.11 the unit has to be checked at IOPP Certificate renewal survey by the manufacturer or persons authorized by the manufacturer. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm. The OMD-24 EV is designed in that way, that only the measuring cell needs to be changed, as this unit carry the calibration onboard. The Calibration Certificate with the date of the last calibration check should be retained onboard for inspection purposes.

If for some reasons the computer unit needs to be changed, it has to make sure, that the memory card will remain on board for at least 18 month. The new computer unit will carry its own memory card. The old card can be insert into the new unit only for reading. Writing is only possible with the card delivered with the new computer unit. For details see section 13.1.

Warranty

Our warranty terms are12 months after installation but maximal 18 months after delivery ex works. The maker undertakes to remedy any defect resulting from faulty materials of workmanship except wearing parts.
The maker's obligation is limited to the repairs or replacement of such defective parts by his own plant or one of his authorized service stations.
The purchaser shall bear the cost and risk of transport of defective parts and repaired parts supplied in replacement of such defective parts.

ANY DISMANTLING OR BREAKING OF A SEAL WILL VOID THE WARRANTY

CONTENTS

1.0 INTRODUCTION

The OMD-24 EV Bilge Alarm Unit has been designed specifically for use in conjunction with 15 ppm oil-water separator units and has a specification and performance which exceeds the requirements of the International Maritime Organization specifications for 15ppm Bilge Alarms contained in Resolution MEPC. 107 (49).

The unit is supplied with 2 works-adjusted alarms at 15 ppm. Other set points (10 ppm or 5 ppm) are possible and can be adjusted on site at any time by using the buttons at the front panel.

If an alarm set point is exceed, the alarms are visible at the front panel and the appropriate relays are switched. In case of malfunction the System LED at the front panel will change from blinking green to permanent red.

For the data logging function the unit requires an status input from the separator.

The OMD-24 EV has an active 0(4) - 20 mA (equal to 0 - 30 ppm) signal output for driving a recorder or external meter.

The OMD-24 EV variant is different from the standard OMD-24 in that it has an electrically operated switchover valve for clean water usage instead of the manually operated valves. The electric valve allows remote control for flushing the measuring cell. The OMD-24 EV monitor will switch to alarm condition, but will continue to display the measurement result, whenever the valve is set to clean water usage.

2.0 IMPORTANT NOTES

a) This equipment must be installed and operated in strict accordance with the instructions contained in this manual. Failure to do so will impair the protection provided.

b) Installation and servicing must be undertaken by a competent and suitable skilled person.

c) The equipment must be connected to the ground according relevant requirements.

d) The unit must be isolated from the electrical supply before any maintenance of the equipment is attempted.

e) All National or local codes of practice or regulations must be observed and, where applicable, are deemed to take precedence over any directive or information contained in this manual.

f) In case of freezing conditions the measuring cell should be emptied complete.

3.0 PRINCIPLE OF OPERATION

3.1 Measuring Principle

An optical sensor array measure a combination of light scattered and absorbed by oil droplets in the sample stream. The sensor signals are then processed by a microprocessor to produce linearised output.

If an alarm (works set point 15 ppm) occurs, the two oil alarm relays are activated after the adjusted time delay.

The microprocessor continuously monitors the condition of the sensor components and associated electronics to ensure that calibration accuracy is maintained over time and extremes of environmental conditions.

An electric valve is operated directly by the OMD-24 EV Bilge Alarm. Whenever fresh water is allowed to flow to the measuring cell, the OMD-24 EV will switch over to alarm condition as required by MEPC.107(49).

3.2 Features

- Robust construction
- Solid suppression capability
- Low maintenance
- Easy installation
- Constant readiness
- Low spare part stock holding
- Works adjustment
- Easy settings via menu

3.3 Adjustment

The unit is delivered with a works calibration according the IMO-requirements. The alarm points are set to 15 ppm.

The "Zero" point is also works calibrated and can be re-adjusted on site by using the programming mode and clean water. See Section 10.4 “Settings-Offset”. A calibration is not permitted. This has to be done according IMO Regulations by the manufacturer or persons authorized by the manufacturer.

3.4 Displays and Alarms

In the unit are two independent oil alarm circuits available. Both can be set separately from 1 to 15 ppm. From the manufacturing both alarms are set to 15 ppm (according IMO). The set points can be changed according to the requirements on site, for example to 10 ppm or 5 ppm. An alarm point setting above 15 ppm is not possible. The adjustment can be done in the programming mode as described in Section 10.4.

In this mode also the individual adjustment of the time delays for the alarms can be done.

Both alarm circuits are also related to an alarm LED on the front panel.

In case of malfunction the “System” LED will indicate any type of internal fault of the unit. This LED is flashing green in normal conditions and is red in alarm conditions.

Additional to the alarm LEDs each alarm circuit is equipped with a relay with potential free alarm contacts. These contacts can be used for external processing of the signal or for control of further functions.

If a malfunction or failure of the power supply occurs, both relays will switch to alarm condition.

4.0 SPECIFICATION OMD-24

Range:	0 – 30 ppm, Trend indication 50ppm
Accuracy	According IMO MEPC. 107(49)
Linearity	Up to 30 ppm better than ± 2 %
Display	Yellow Graphic Display
Power Supply:	24 V AC or DC +/- 10%
Consumption:	< 15 VA
Alarm Points 1 + 2:	Adjustable between 1 - 15 ppm (Works adjustment 15 ppm)
Alarm 1 Operating Delay: (for annunciation purpose)	Adjustable between 1 – 540 sec. (Works adjustment 2 sec)
Alarm 2 Operating Delay: (for control purposes)	Adjustable between 1 – 10 sec. (Works adjustment 10 sec)
System Fault Alarm:	Red LED
Alarm Contact Rating:	Potential free 1 pole change over contacts, 3 A / 240 V
Alarm Indication:	Red LEDs
Output Signal:	0 – 20 mA or 4 – 20 selectable active current loop, ext. Load < 150 Ω
Clean Water Pressure	0-6 bar
Sample Water Pressure:	0,1 – 6 bar
Sample Flow:	Approx. 0,1 - 3 l/min depend. to pressure
Ambient Temperature:	+ 1 to + 55° C
Sample Water Temperature:	+ 1 to + 65° C
Roll:	Up to 45°
Size (Computer Unit)	185 mm W x 210 mm H x 65 mm D
Size (Measuring cell Assembly):	140 mm W x 160 mm H x 120 mm D
Distance (Computer Unit to Measuring Cell)	Up to 0.5m Option: up to 5m upon request
Degree of Protection:	IP 65
Weight:	2.5 kg
Pipe Connections:	R ¼" Female

Technical specifications are subject to change without notification

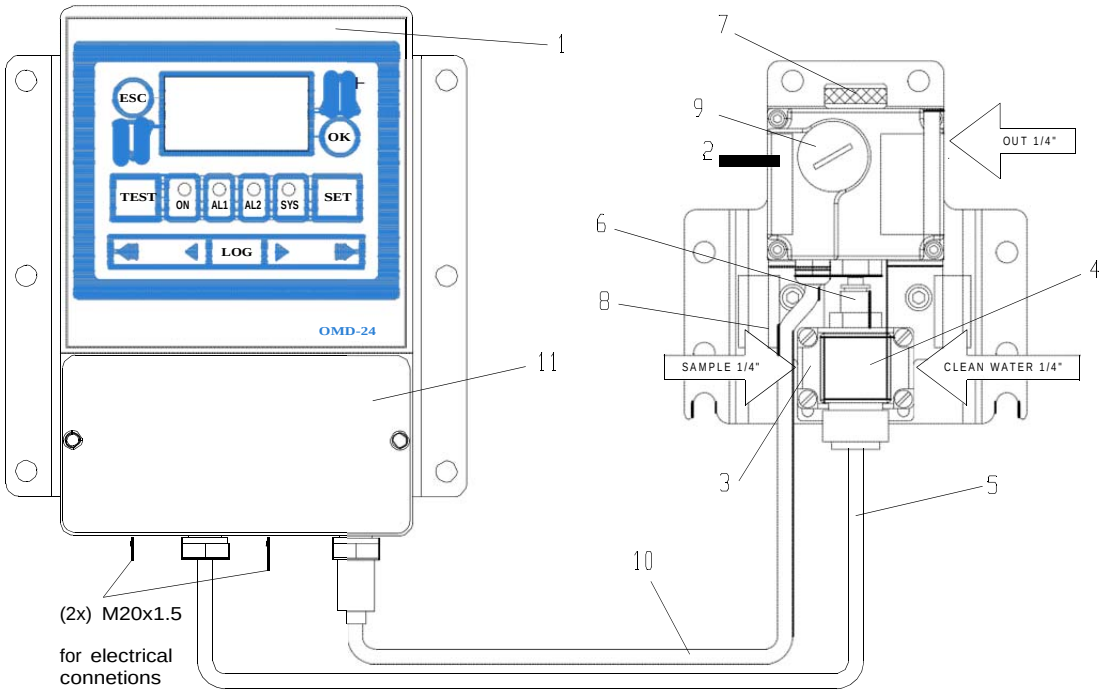
5.0 CONSTRUCTION

There are 2 main parts which contained in an OMD-24:

The computer unit contains the display PCB with the data logger and the terminals for external connections.

The measuring cell is built out of an anodized all-aluminium body with inlet and outlet block in stainless steel. This rugged cell contains optics and electronics and is connected with the computer unit via a plugged data cable. It is mounted onto a stainless steel support that also holds the valve assembly. Sample water flow and clean water usage are controlled by an electric switchover valve. This assembly is connected to the measuring cell by a push-in connector.

Both components can easily be mounted in wall or bulkhead installation. It is also possible to split the computer unit from the measuring cell if the available space is not sufficient.



1	Computer Unit	5	Valve Cable	9	Desiccator Cap
2	Measuring Cell	6	Push-In Connector	10	Communication Cable
3	Electric Valve	7	Head Screw	11	Terminal Cover
4	Valve Connector	8	Valve Plate		

Fig. 1

6.0 INSTALLATION (Refer to Fig. 2 and Fig. 3)

See Section 2 for important notes concerning installation.

The OMD-24 EV Monitor should be located as close as possible to the oily water separator to minimize response delays. According MEPC.107(49) the layout of the installation should be arranged so that the overall response time (including the response time of the 15 ppm Bilge Alarm, which is less than 5 s.) between an effluent discharge from the 15 ppm Bilge Separator exceeding 15 ppm, and the operation of the Automatic Stopping Device preventing overboard discharge, should be as short as possible and in any case not more than 20 s.

Mount the OMD-24 EV Monitor by means of M6 or M8 screws on to a rigid vertical surface and preferably with the display panel of the monitor at eye level. For service and maintenance sufficient space to all sides should be available.

Care must be taken at mounting of the pipes connections to avoid any torsion of the housing and damage of the instrument.

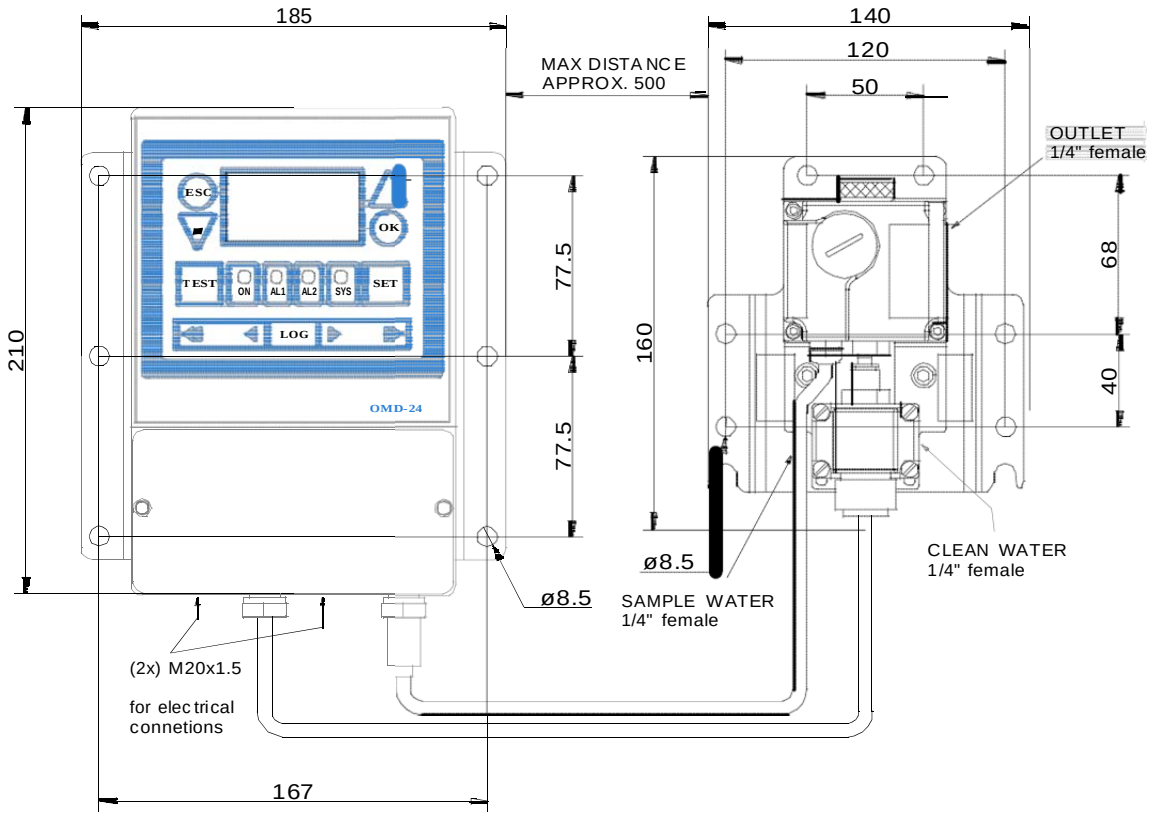


Fig. 2

7.0 PIPING (Refer to Fig. 3)

Connect the OMD-24 EV Monitor to the sample point of the oily-water separator outlet and to a source of oil free water employing 10 mm OD copper or stainless steel pipe. The sample point should be located on a vertical section of the separator outflow piping to minimize the effects of any entrained air. The tapping point should be at a level above the outlet of the monitor to ensure the sample cell is flooded at all times.

If connection to a vertical section of the separator outlet piping is impractical, the tapping may be made into the side of the horizontal pipe. Avoid top or bottom entry.

For separator discharge pipes up to 75 mm OD a standard "T"-type junction of the welded or screwed type is satisfactory for the tapping point. For the separator discharge pipes of 80 mm OD and above a sample probe should be employed which protrudes into the discharge piping by approx. 25 % of the ID of the pipe.

If possible it is recommended to install a manual valve into the clean water line next to the OMD-24. This allows to stop any water flow through the instrument for easy manual cleaning. No additional valve in the sample line can be allowed.

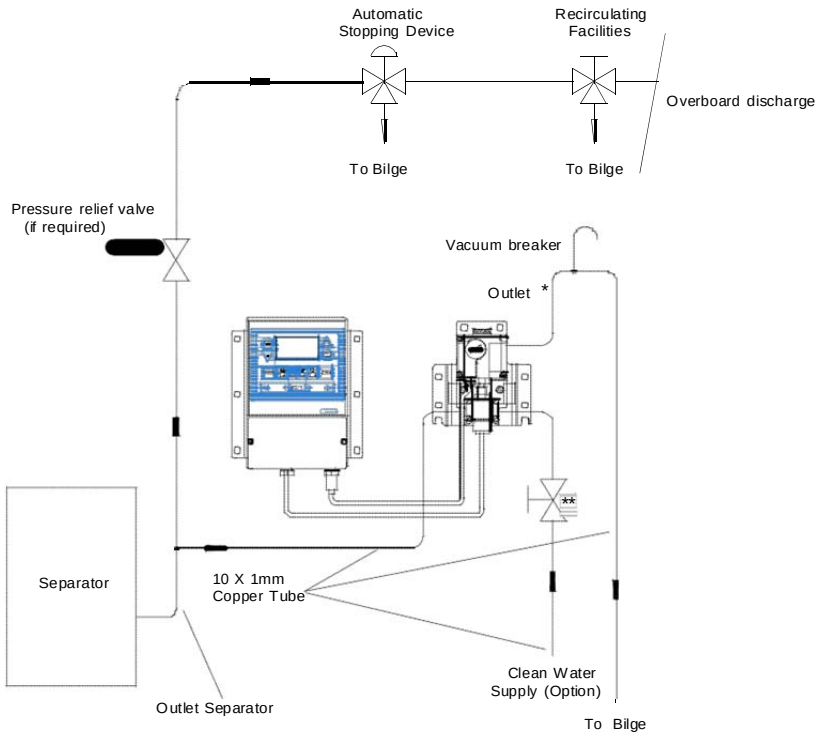


Fig. 3

* Inlet & Outlet connections R1/4" Female
** Additional valve recommended

8.0 WIRING (Refer to Fig. 4 + 5)

See Section 2 for important notes concerning wiring.

This unit must be connected to the mains supply via a suitable rated and approved fused isolator unless such fusing / isolation is provided by associated equipment. When fitted, the isolator should be close, readily accessible and marked as to function.

Electrical connections are made through the metric cable gland openings prepared underneath the instrument.

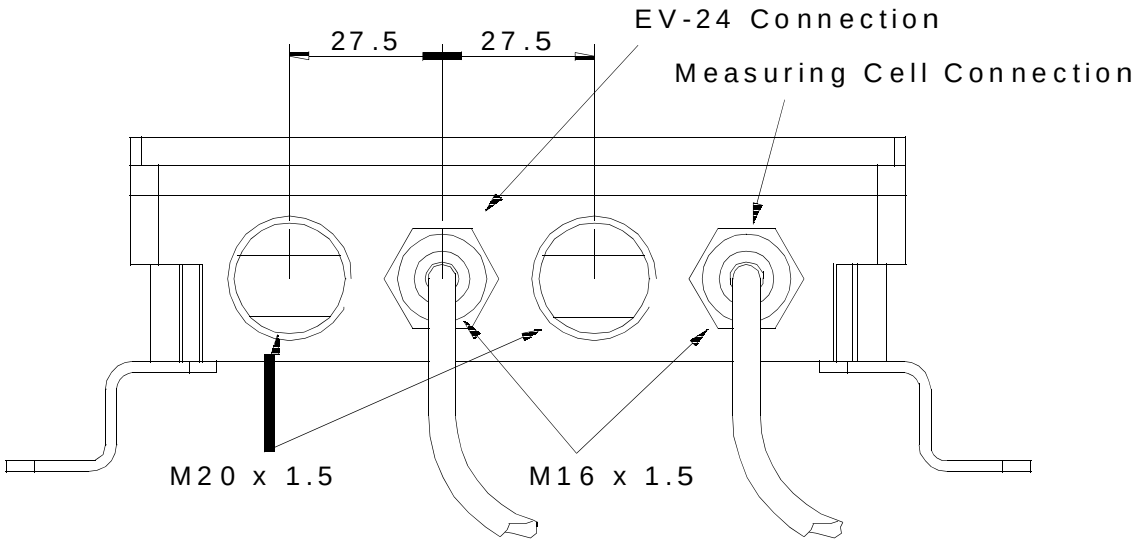


Fig. 4

Precise wiring details will vary dependent upon the control system to be employed but the most frequently used systems employ alarm relay 1 for alarm only and alarm relay 2 for control purposes.

Electrical connections are made to the terminal blocks inside the computer housing. Wires are connected to the terminals by pushing a suitable screwdriver into the clamp holes to release the internal spring loaded clamps. After the wire is inserted to the terminal and the screwdriver is removed, the wire is fixed.

If the instrument is operated at high voltages, additional care has to be taken to provide reliable ground connections. Ground (PE) can be connected direct to the terminal or, if this is not sufficient according local rules, to the computer housing left side.

The instrument provides a pilot voltage output at Terminals 3&4. This is internally connected to the power supply input (Terminals 1&2). The pilot voltage can be used to supply additional external circuitry, e.g. alarm lamps or electrical valves.

Please note: any device connected to the pilot voltage output must be rated for the voltage the instrument is supplied with. Do not use the pilot voltage for driving motors, heaters or other high load devices. The pilot voltage is intended for alarm purposes only.

1-2 Power Supply
3-4 Pilot Voltage Output (Same as Power Supply)
5-7 Potential free Output Alarm 1 (Change over contact)
8-10 Potential free Output Alarm 2 (Change over contact)
11-12 Input Status Switch from Separator (Close when running)
13-14 Input Reserved for future use
15-16 Input Flow Direction Switch (Deckma Delivery)
17-18 (Optional) Signal Output 0(4) to 20 mA
19-20 Input External Fresh Water Usage
21-22 Output External Fresh Water Valve (Deckma Delivery)

POWER SUPPLY MUST HAVE FUSE T2A

POWER SUPPLY 24V AC/DC ONLY

LINK TERMINALS 15&16 IF NO FLOW SWITCH IS PRESENT

EXAMPLE
Connections may vary with different separator control boxes

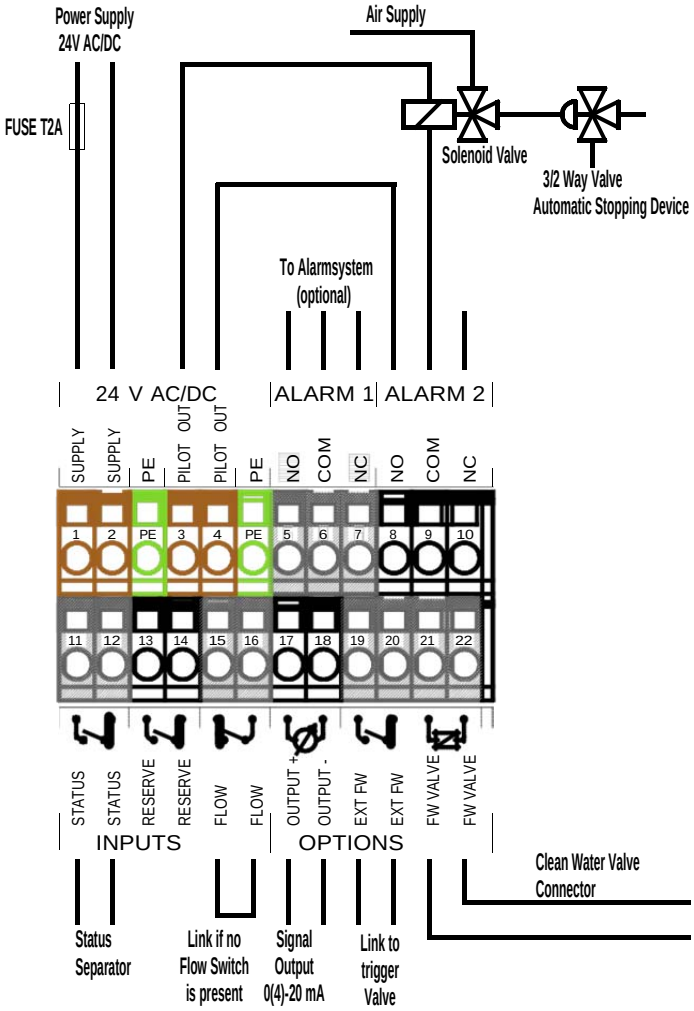


Fig. 5

Close front cover complete after electrical installation. Water inside the instrument may result in corrosion and malfunction. Alarm contacts description is in alarm (non-energized) condition.

8.1 Typical Control System

The installation on site has to make sure that in case of any loss of power supply and/or loss of air supply for the automatic stopping device the overboard discharge valve close the overboard line and open the re-circulating line.

The system showed in the example, employs alarm relay 2 to control a pneumatic solenoid valve which energises or de-energises a pneumatically operated 3 - way valve as depicted in Fig. 5.

The separation process will continue until such time as the pollution level falls below the alarm set point at which time the discharge will be directed overboard.

A pump stop system is according MEPC.107 (49) not allowed.

8.2 Remote fresh water switching

The OMD-24 EV allows to remotely control the valve operation. To switch the OMD-24 EV to clean water terminals 19&20 have to be linked. The OMD-24 EV will stay in clean water condition, and will remain in alarm condition, as long as the link (terminals 19&20) is present. It is recommended to use a potential free relay switch for the link to electrically insulate the OMD-24 EV from any external voltages.

9.0 POWER SUPPLY

See Section 2 for important notes.

The unit is designed for a power supply of 24 V AC or DC. The power supply must have a fuse rated no more then 2A. Power consumption of the OMD-24 EV is increased by approx. 10VA to about 15VA while the Clean water valve is energized (clean water flushing).

10.0 COMMISSIONING

See Section 2 for important notes.

On completion of the installation, wiring and piping carry out the following checks:

10.1 Electrical

a) Check that the power supply is connected to the terminals 1 + 2 of the terminal block.

b) Check the wiring of the automatic stopping device and to the alarm system is according the IMO Requirements.

c) Check that the grounding has been made according to the relevant regulations.

d) Check that the Clean Water Valve is connected to the terminals 21&22 of the terminal block and that the connector is seated firmly on the valve.

e) Check that the remote trigger wiring (if any) is connected to terminals 19&20 of the terminal block.

10.2 Piping

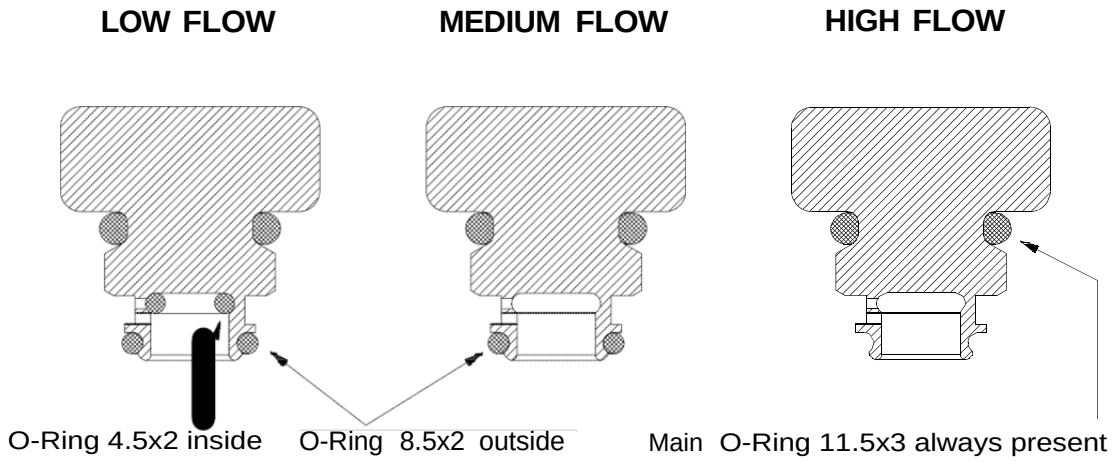
a) Check all piping connections for leaks and rectify as appropriate.

10.3 **10.3 Functional Tests**

a) Switch on the instrument and make sure, that the Power LED is illuminated and the display is showing the initializing display for about 15 sec. After that time it will change to the standard display, showing the actual measurement.

b) Run oil free water through the instrument to purge the system.

c) Adjust the flow rate through the unit by using the small O-Rings in the cell cap.



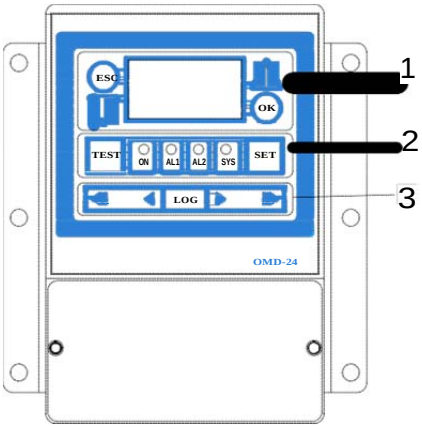
NB: The flow rate should be checked on both, the clean water supply and the separator sample supply. If the clean water supply is obtained from a high pressure source, the flow rate will be higher than from the sample point.

The flow rate is not influencing the accuracy of the instrument. The adjustment is only important for the time delay between the sample point and the monitor.

d) During oil free water is running through the monitor check the Zero adjustment. The display should be "0" to “2” and the status will show “FW”. If the display varies by greater amounts, it may be that air entrainment is present. If this is the case, the cause must be located and rectified.

f) If the Zero need to be adjusted, this can be done in the programming mode as described in section 10.4. (Settings – Offset)

10.4 Programming Mode



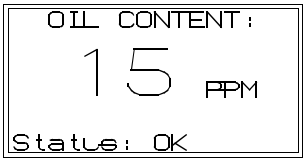
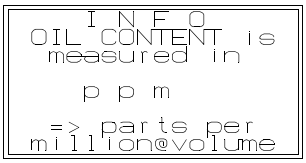
There are 3 groups of push buttons to control the functions of the display. Navigation buttons are in group 1. Functional buttons are group 2. Group 3 is for data logger operation.

In the programming mode the alarm set points, the time delays, and the offsets can be modified. It is also possible to reset to the factory default values at any time.

The clock is factory set for GMT, **G**reenwich **M**ean **T**ime, and cannot be changed.

For operating the Electric Clean Water Valve press the “ON” button, select “FW FLUSH”, change the Status to “ON”. The OMD-24 EV will switch over to fresh water immediately, and remain in fresh water setting for 2 minutes before switching back to normal operation. If a prolonged flushing is desired, it can be retriggered within the 2 minutes, or repeated afterwards.

Any time is is switched to fresh water, the OMD-24 EV will be in alarm condition, as required by IMO MEPC.107(49).

 Initial Display. Will disappear a few seconds after power up.	 Normal Operation Display. Pressing the + button will display additional information. Pressing the OK button will display more detailed information about the current status.	 Exit from SYSTEM-info menu by pressing the ESC button. Refer to Fault finding table in manual for explanations of status information.

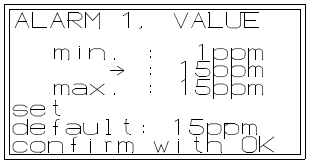
Pressing the AL1 button leads into SETTINGS menu, Alarm1 settings preselected.

Pressing the Al2 button leads into SETTINGS menu, Alarm2 settings preselected.

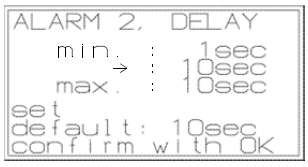
Pressing the SET button from Normal Operations Display leads into SETTINGS menu, set default option preselected.

At the SETTINGS menu the alarms, time delays, the Offset and optionally the output signal can be modified within the limitations. Select the required point by using the „+“ or „-„ button. To modify settings press the 

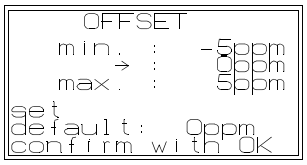
button.



To change the value, press the “+” or “-“ button. Confirm with “OK”.



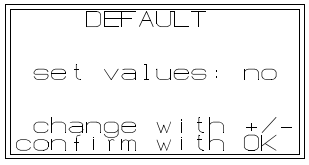
To change the value, press the “+” or “-“ button. Confirm with “OK”.



To change the value, press the “+” or “-“ button. Confirm with “OK”.

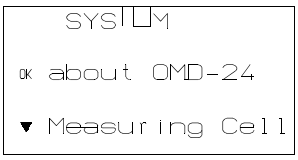
At the SETTINGS menu the all settings can be reset to the factory default values. To reset to factory values once again press the 

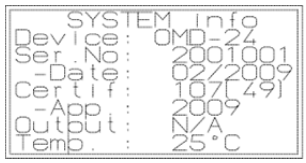
button.

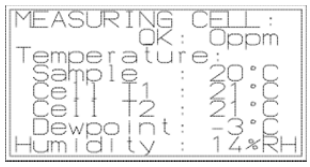


To change to “yes”, press the “+” button. Confirm with “OK” to reset all settings to the factory default settings.

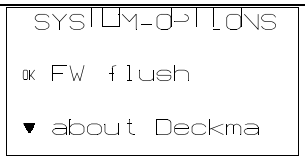
<table>
<tr>
<td rowspan="2"> 

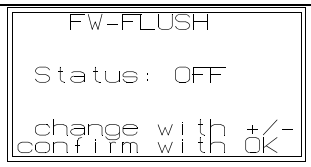
Pressing the SYS button directly leads into SYSTEM menu.</td>
<td rowspan="2"> 

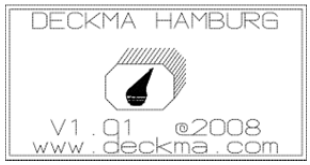
Select if you want information about the instrument or information about the measuring cell.</td>
<td> 

Exit from SYSTEM-info menu by pressing the ESC button.</td>
</tr>
<tr>
<td> 

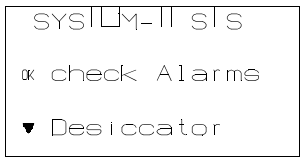
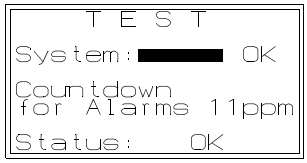
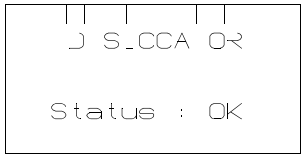
Exit from MEASURING CELL menu by pressing the ESC button.</td>
</tr>
<tr>
<td rowspan="2"> 

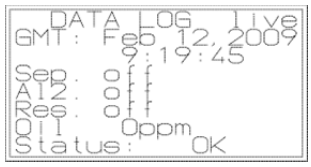
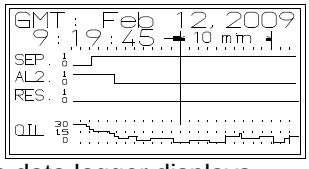
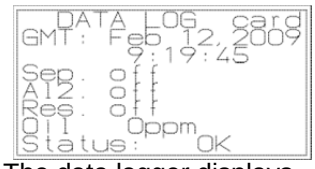
Pressing the ON button directly leads into the SYSTEM-OPTIONS menu.</td>
<td rowspan="2"> 

Select if you want to activate the (optional) clean water valve or if additional information should be displayed.</td>
<td> 

To change to “ON”, press the “+” button. Confirm with “OK” to activate the optional clean water valve for a limited time.</td>
</tr>
<tr>
<td> 

Exit from information display by pressing the ESC button.</td>
</tr>
</table>

TEST Pressing the TEST button directly leads into the SYSTEM-TESTS menu.	 Select if you want to activate the Alarms Test or if Desiccator status information should be displayed.	 Wait until Alarms Test is completed, as indicated by countdown value and progress bar.
		 Exit from information Desiccator status display by pressing the ESC button.

LOG The LOG button leads into the data logger function.	 Initially the data logger displays the live data. With the LOG button it can be switched to the graphical display mode.	
By pressing the LOG button twice the recorded data display mode is invoked. **LOG** **LOG**	 The data logger displays recorded data. With the LOG button it can be switched to the non-graphical display mode.	 The data logger displays recorded data. With the LOG button it can be switched to the graphical display mode.
	 In both data display modes the arrow buttons can be used to navigate to another date/time of recorded data.	

NB: *Changed values have to be confirmed by pressing the " OK " button. Otherwise the existing values remain valid.*

11.0 OPERATING INSTRUCTIONS

Instead of the two independent mechanically interlocked manual valves for sample and clean water at the standard OMD-24, an OMD-24 EV has no manually operable valve handles. Any operation is triggered via the front panel, or triggered remotely. The OMD-24 EV will only allow overboard discharge in Normal Operation setting.

Instrument start-up sequence:

a) Switch on the power supply.

b) Allow a period of time for water entering the sample tube.

c) Flow oil free water through the system for a few minutes and check that the display show 0 to 2 ppm. If not, clean proper before adjusting the unit according section 10.4 “Settings - Offset”.

d) Switch the instrument sample supply from the clean water supply to the separator sampling point connection.

e) The instrument is now ready for use.

11.1 Operator Notes

a) When oily water flows through the instrument the display will show the actual value of oil content.

b) If the oil concentration exceeds the adjusted threshold (works adjustment 15 ppm), the alarm indicator 1 will be illuminated in intervals during the selected time delay before it change to steady light and the associated alarm relay will operate. Accordingly also the alarm indicator 2 will be illuminated and its associated alarm relay will take the appropriate shut down action.

12.0 OPERATOR MAINTENANCE

See Section 2 for important notes.

AT WEEKLY INTERVALS:

a) Flush the cell with oil free water.

b) Stop sample and oil free water flow.

c) Unscrew and remove the cell cap.

d) Insert a suitable Cell Cleaning brush (ID 187941) into the cell and clean it with upwards and downwards motion through the entire length of the cell several times.

e) Remove the Cell Cleaning brush and replace the cell cap.

f) Switch Clean Water Valve to fresh water and allow oil free water to flow through the instrument for a few minutes.

g) Observe that the display is showing "0" to “2”. If not, clean again.

h) Examine the status of the desiccator (Chapter 10.4, TEST button). The Desiccator status display will indicate if the desiccator is worn out and working insufficient. If the desiccator status is any other then OK, the desiccator should be replaced. Additionally, the Measuring Cell dew point can be checked. The dew point should be lower then both sample temperature and clean water temperature.

   Insufficient desiccator performance could result in condensation inside the measuring cell and wrong measurement and/or damage to optical components. Insufficient desiccant container can easily be exchanged by removing the desiccator cap. Just unscrew the desiccator cap, replace the desiccant container by a new one (ID 187941). Make sure to close the desiccator cap properly. Allow the new desiccator some time to absorb the humidity inside the measuring cell.

j) Switch valve to Normal Operation position

13.0 FAULT FINDING

See Section 2 for important notes.

The OMD-24 EV will indicate several malfunctions in the status line of the display. Pressing the “OK” button will lead into an information window, similar to the items listed in the table below.

Status	Reading	System-Alarm-LED	Alarm-circuit 1,2	Reason	Servicing
OK	0..49	Green / Blinking	Normal operation	Normal operation	-
OK	EE	Green / Blinking	Alarm	Sample reading is out of range: Oil content too high, dirty sample tube	Wait until oil content is within the range, clean sample tube
FW !	0..49 / EE	Green / Blinking	Alarm	Instrument using freshwater (via user interaction or linked Terminals 19&20)	remove/check external wiring
Sample?	EE	Red / Steady	Alarm	Meter is not able to measure the sample: no water in, oil content much too high, no light transmission possible	Check sample, clean sample tube according Page 21
Flow!	0..49 / EE	Green / Blinking	Alarm	Flow Switch (Terminals 15&16) open	Check flow input
Com?	EE	Red / Steady	Alarm	No communication between computer unit and measuring cell	Check connection between computer unit and measuring cell
Datalog?	0..49 / EE	Red / Steady	Alarm	Datalogging is not possible: no DECKMA memory card inserted	Insert the active memory card
				Datalogging is not possible: a read only card has been inserted	Insert the active memory card
				Datalogging is not possible: a new DECKMA memory card has been inserted, but has not been activated	Activate card or insert the active memory card
Desicc	0..49 / EE	Green / Blinking	Normal operation	Measuring Cell humidity critically high (>40%RH)	Check/Replace Desiccator
Humid	0..49 / EE	Green / Blinking	Normal operation	Sample temperature below dewpoint. Instantaneous condensation possible	Check/Replace Desiccator
Int.Err		Red / Steady	Alarm	Internal error	Restart the system

Important Information!

Cleaning of Glass Tube at 15 ppm Bilge Alarms OMD-24

IMPORTANT:

NEVER DISASSEMBLE THE UNITS AS THIS MAY VOID THE CALIBRATION AND THE CERTIFICATION!

CLEANING HAS ONLY TO BE DONE TROUGH THE REMOVED CELL CAP

BY USING THE CLEANING BRUSH!

In most cases of high reading with clean water the measuring cell has a problem with internal coating of the glass tube. Just cleaning with brush and clean water will not help in this case.

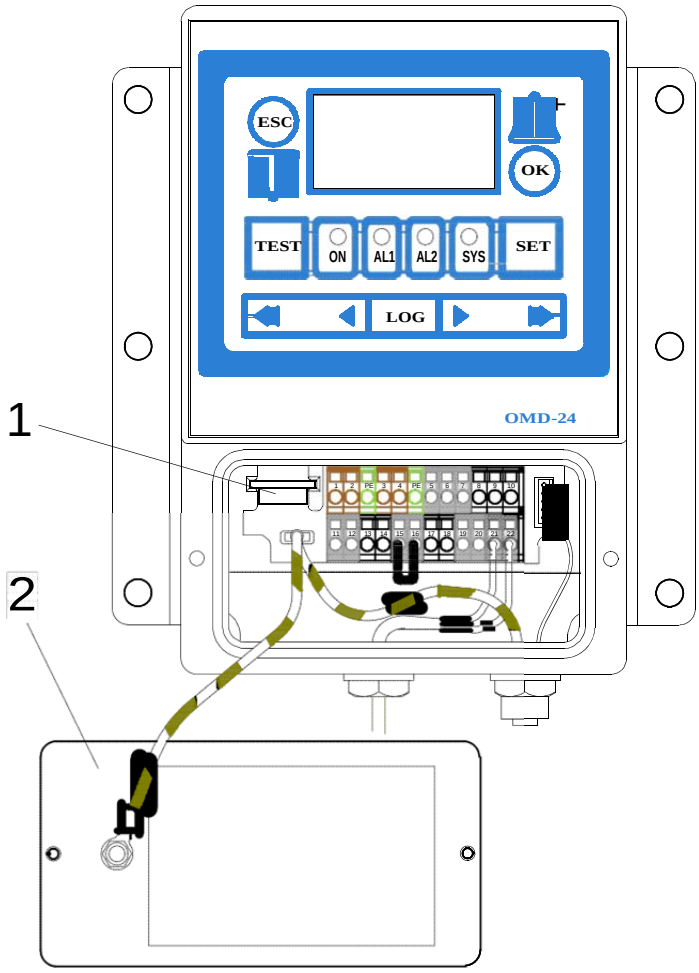
Please carry out the following instructions to make sure, that the glass tube is really clean. Than the unit will show 0 to 2 ppm with clean water.

Check Measuring cell humidity readings and desiccator status. Desiccator status must be OK and dew point should be considerably lower then both sample temperature and clean water temperature. If not, change desiccant container and allow new desiccator to absorb the humidity inside the measuring cell.

Clean the glass tube by using the cleaning brush under assistance from some cleaner.

In certain cases iron oxide can be deposited inside the glass tube (brownish surface deposit on the glass tube), depending on environmental conditions on site. In this case some citric acid, juice from a fresh lemon may help, if you fill it into the glass tube and leave it at least over night before using the cleaning brush for removing the last dirt from the glass tube. Also, in cases of calceous deposits in the glass tube, treatment with some mild acidic cleaner, citric acid, or vinegar may allow removal of the deposits. Make sure, that the cleaning fluid will stay in the tube and is not draining. Sometimes the cleaning with citric acid or vinegar has to be done 2 or 3 times for at least 12 hours, depending on the thickness of the coating.

Additional use of some slightly abrasive cleaning powder or tooth paste may also assist in cleaning as a last resort. Please note that some powerful abrasives may scratch the glass surface, permanently damaging the instrument.



1: Memory Card

2: Terminal Cover

Fig. 6

13.1 Memory Card (refer to Fig. 6)

The Memory Card is located next to the terminals in the computer housing. It is suitable for the life of the instrument, as it is calculated to the according MEPC.107(49) required storage time of at least 18 month. When the card is full, the oldest entry will be overwritten, so that a replacement is not necessary. Under normal use the card should not be taken out, as this is linked with the specific system. The card can be read in other OMD-24 or OMD-24 EV units, but writing is only possible in the related system.

If no Memory Card is mounted or a card from another system is mounted, the unit will be in alarm condition

14.0 CALIBRATION

15 ppm Bilge Alarms built according MEPC.107(49) have to be protected against access beyond the checks of instrument drift, repeatability of the instrument reading and zero adjustment. For this reason the instrument is electronically sealed, so that only the manufacturer or his authorized persons, equipped with the related tools, are able to get access for changing the calibration.

To provide a simple procedure for check the instrument aboard ship, the OMD-24 EV is constructed in that way, that the zero check also confirms the instrument drift within the specifications.

14.1 Calibration and repeatability check

a) Switch off the power supply and stop any water flow.

b) Clean the sample tube accurate by using a suitable cell cleaning brush as described under Section 12.0. Make sure, that the offset is correct at ± 0.

c) Run clean water through the instrument.

d) If it is sure, that non aerated, clean water is in the instrument, the reading should be 0 ppm ± 2 ppm.

e) Continue as described under Section 11.0.

Note § 4.2.11 of MEPC. 107(49):

The accuracy of the 15 ppm Bilge Alarms should be checked at IOPP Certificate renewal surveys according to the manufacturers instructions. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm. The calibration certificate for the 15 ppm Bilge Alarm, certifying date of last calibration check, should be retained onboard for inspection purposes. The accuracy checks can only be done by the manufacturer or persons authorized by the manufacturer.

14.2 Function Test at Classification Survey and Port State Control

All 15 ppm Bilge Alarms leaving our works are calibrated according the requirements with an accuracy of better than +/- 5 ppm within the measuring range. The alarm points are pre-set to 15 ppm and can only be changed to a lower value on site. A setting to a higher value is not possible To provide a simple procedure for check the instrument aboard ship, the OMD-24 EV is constructed in that way, that the zero check also confirms the instrument drift within the specifications. The Test button starts a self test routine and allows to put both alarms contacts into alarm condition. The instrument will count down from a assumed high reading (30ppm) downwards until the assumed value is equal to the actual measured ppm value. Note that this test will only switch the alarm contacts to non-alarm condition, if the sample contains less than 15ppm oil content and all other conditions for proper measurement are ok.

Blohm + Voss **Industries**

Manual for TURBULO separarator pump

Typ TSP

Manual Pump TSP
Rev. 1.02
11.07
12 pages

Content

1 TURBULO Separator Pumpe TSP

1.1 Pump with soft packing

1.1.1 Safety

The staff for operation,maintenance,inspection and assembly must have required qualification for this work.

Pump must not run dry
Pump must not run against closed valves

Observe the relevant safety regulations.
Maintenance work on pressure-loaded parts of the pump is only allowed after such pump parts have been pressure - released.

1.1.2 Motor properties

Mechanical properties			
Type	------	------	Nord/Siemens
Frame	IEC34/7	------	ILA5Alu.alloy
Mode of operation	DIN57350	------	S1
Type of construction	--		IM V1/B5
Protection	DINVDE0530		IP 55
Cooling	IEC34		Radial-flow fan
Insulation Class	------		Max.permissible temperature rise 105 K Max.permissible cont. temperature 155 deg C
Standard connection	------		Triangle
Phases	------		3
Ambient temperature	------	deg C	40 deg C = 100% rated value 60 deg = 82%C rated value
Terminal box	DIN40050		PG 13,5

*Table **1**-1: Pump characterictics*

1.1.3 General data

Size (400/460(440)V)	m^3/h	0.25	0.5	1	2.5	5	10
Noise level DIN EN 21680 L_{WA} / L_{pfA}	dB	~ 53/65					
Electrical properties (400/460(440)V)							
Rpm	1/ min	1400 – 1700					
Nameplate power ~	kW	0,55	0,55	0,75	0,75	1,5	3/3.45
Rated current ~	A	1,42	1,42	1,9	1,9	3,6	6.5/5.7
Starting current ~	A	7	7	9,4	9,4	17	38
Efficiency at 100% rated output ~	eta (%)	74	74	74	74	74	80
Efficiency at 50% rated output	eta (%)	70	70	70	70	70	79
Power factor at 100%	phi	0,79	0,79	0,79	0,79	0,81	0,80
Power factor at 50%	phi	0,3	0,63	0,63	0,63	0,63	0,71

Pump properties for a new pump		
NPSH req. (Is considered)	m	3
Psuction	bar	-0,65
Delta P	bar	3,3 (100%)

*Table **1**-2: General data*

NPSH = net positive suction head, value for the prevention of vapour bubbles.The pumps are designed to be basically wear-free.The rpm, and the axial velocity resulting from the from rotor/stator geometry, are designed to be moderate.The NPSH have been taken into concederation.The pump stages are adapted to the pressure requirements.The stator is of an NBR material which resists the contents of the bilge water under normal conditions. The rotor is of 1.4571 steel (stainless steel) . All pumps are fitted with cardan joint. The gear wheel bodies are of mild-steel parts.The gear teeth are hardened and ground.The teeth are durable in accordance with DIN 39990.The housing consists of the material GG20 (cast iron).

2 Starting-up

A dry running protection is necessary.
A standard value for leakage of the stuffing box packing are 10 – 40 drops/min.

2.1 Inspection before starting-up

Check direction of rotation of the pump and drive engine by switching on the e-motor for a short time. See arrow of direction of rotation on the motor lantern of the eccentric helicall rotor pump.
Check position of gear venting screw. Gear venting screw must always be at the highest point of the spur gear.
Remove plug of the venting screw. In case of non-observance there will be a leak at the shaft seals due to overpressure in the spur gear.

2.2 First starting-up of the eccentric helical rotor pump:

Completely open the shut-off valves in the suction and discharge line.

2.2 Maintenance

The spur gear is filled with a transmission lubricant. There should be a lubricant exchange every 10 000 working hours. See recommendation of lubricant

A slight leakage of the stuffing box packing is to be regarded as normal. In case of heavy leakage slightly tighten the gland by hand.

2.3 Lubrication

Pump	m^3/h		0.25/05	1	2.5	5	10	
Cardan	-----	cm^3	8	8	8	26	26	x
Gear Vertical	-----	cm^3	400	400	400	400	1000	xx
Gear Horizonatal		cm^3	250	250	250	250	700	xx
Motor	-----	cm^3	4	6	11	11	17	x
x = Maintenance free XX = > 10000 h using mineral oil XX = 18000 h using synthetic oils								

*Table **2-1:** Lubrication amounts*

Mineral oil /fat		BP	Esso	Mobil	Shell
Cardan	./.	HT-EP 00	---	----	------
E-Motor	./.	Energrease LS3	Beacon 3	Mobilux 3	Alvania G3
Gear ISO Vg220		Energol GR-XP 220	Spartan EP 220	Mobilgear 630	Shell Omala 220
Syntetis Oil/Fat		BP	Esso	Mobil	Shell
Cardan	./.	Enersyn GSF	S 420	Glygoyle G00	Tivala Com A
E-Motor	./.	-------	Beacon 325	Temp SHC 32	Aero Shell 16
Gear ISO Vg220		Enersyn SG-XP 220	Oel S220	Glygoyle 30	Tivela WB

*Table **2**-2: Brands*

3 Break downs and their possibilities

Break downs → / Possible causes ↓	Reduced capacity	Pump does not suck in	Reduced discharge pressure	Noises in the pump	Blocking of the pump	Driving motor becomes warm
Leaky sealing Fig I/56	X	X	X	X		
Leaky suction line system	X	X	X	X		
Pump is not full		X		X		
Appearance of caviation: verify pressure in the suction branch, increase possibly cross-section of line, check suction line. Check viscosity.	X	X	X	X		
Wrong direction of rotation		X				
Vent or drain screws not screwed in		X				
Foreign bodies: try to remove foreign bodies from handling elements by turning the driving shaft opposite to normal direction of rotation and dismantle stator.					X	
Congealed liquied handled: heat pump and system. Dismantle pump.					X	
Bearing damage: dismantle bearing housing:Exchange					X	
Test driving shaft for eccentricity. Pump to be re-aligned.				X	X	X
Verify current consumption and speed	X		X			X

*Table **3**-1: Breakdowns of the pump*

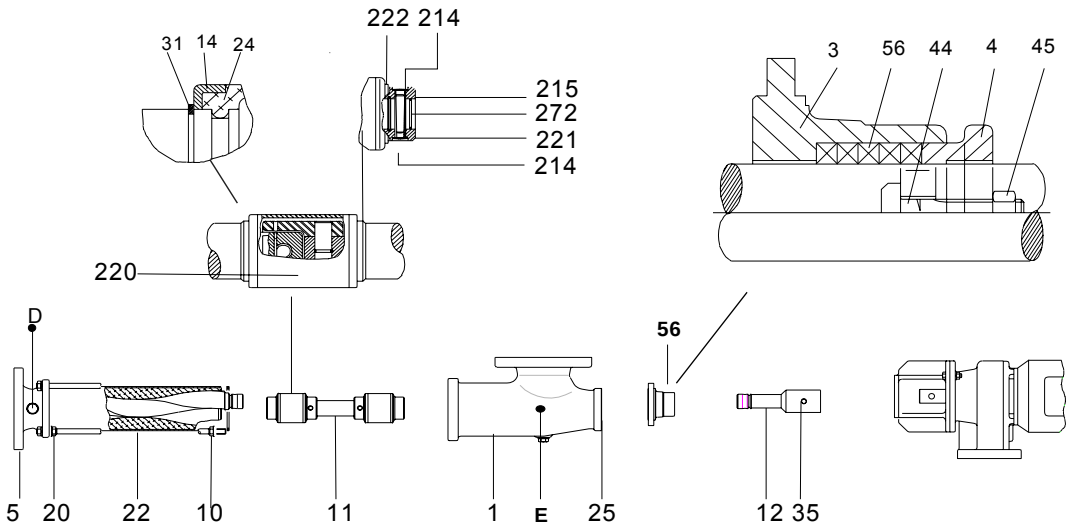


Fig . I Pump

Pos	Qu	Beschreibung/Description	Pos	Qu	Beschreibung/Description
P1	1	Gehäuse Casing	P25	1	Dichtung Gasket
P3	1	Stopfbuchsgehäuse Stuffingbox housing	P35	1	Spannstift Locking sleeve
P4	1	Stopfbuchsbrille Gland	P44	2	Hammerkopfschraube Hammerhead bolt
P5	1	Stutzen Branch	P45	2	Mutter Hexagonal nut
P10	1	Exzenterschnecke Helical rotor	P56	1	Packung Packing Ring
P11	1	Gelenkwelle Joint shaft	Pumpe 0.25 2.5 2 Kardan pro Gelenkwelle Pump 0.25 -2.5 2 Cardan joints per joint shaft		
P12	1	Antriebswelle Drive shaft	P220	1	Cardan complete (14/17/24/31/213/219)
P20	4	Zuganker/Scheibe/Mutter Tension rod /spring ring/nut	Pumpe 5-10 2 Kardan pro Gelenkwelle Pump 5-10 2 Cardan joints per joint shaft		
P22	1	Gehäuseeinsatz Stator	P220	1	Cardan complete (214/215/221/22/272)
E = Connecting for dry running protec ting if pump is mounted loose			D = Connecting for dry running protecting if pump is fitted at the separator		

Table **3**-6:. Pos discription of the

4 Repair of the pump

4.1 Dismounting

Close shut-off valves in the suction- and discharge line.
Remove drain plugs and sealing rings at the pump casing (1) and at the discharge branch (5).
Loosen fastening screws at the connections between pipe lines and eccentric helical rotor pump (suction and delivery flange).
Loosen nuts (20) and spring rings (20) at the tension rods (20) and remove discharge branch from the stator.
Draw stator off the rotor (22).
Loosen nuts and spring rings at mounting flange of the pump casing and remove the latter.

4.2 Dismounting of the cardan for pump A0.25 –2.5

Take off safety rings (31) and joint sleeves (14) of the cardan joint on the eccentric side.
Push joints sleeve (24) over the cardan joint on the joint shaft (11).
Knock clamping sleeve (219) out of the cardan joint, then press out joint bolt (17).Pull rotor out of cardan joint.

4.3 Dismounting of the cardan for pump 5 -10

Bore a hole of 5 mm diameter in the lock washer (214) (“A”-Side”).Knock the tapered pins (272) with the Zyko-sleeve (215).Pull rotor out of the cardan.

4.4 Assembly

Assembly has to take place in reverse order to dismounting.
Before assembly the cardan joint has to be filled with grease.

4.5 Motor

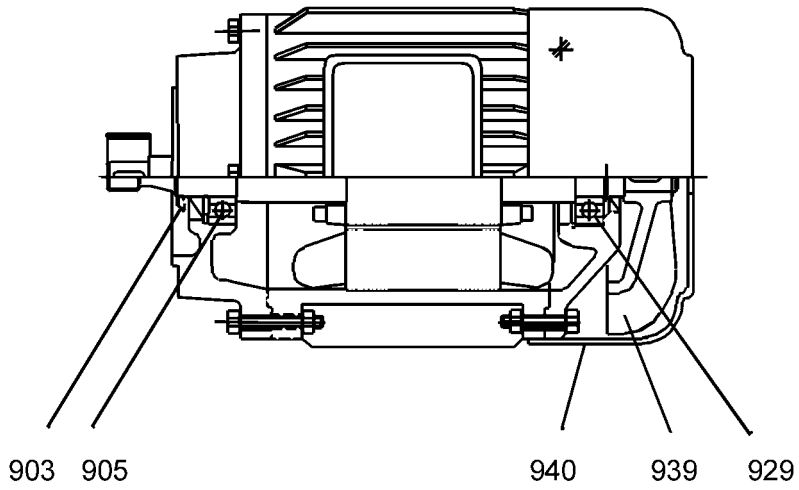


Fig 3 Motor

Pos	Qu	Discription	Beschreibung
M903	1	Shaft seal	Wellendichtung
M905	1	Ball bearing	Lager
M929	1	Ball bearing	Lager
M939	1	Ventilator	Ventilator
M940	1	Ventilator cover	Ventilatorhaube

Table **4**-7: Pos discription of the motor

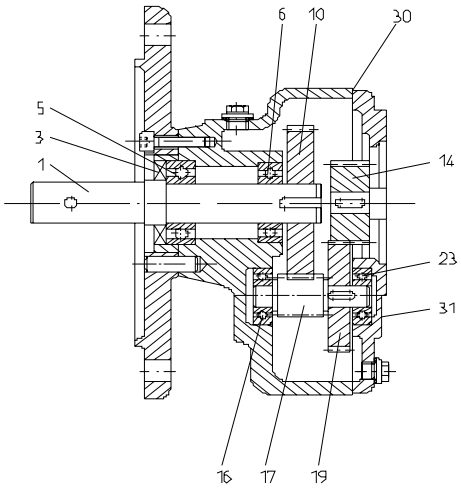


Fig. 4 Gear

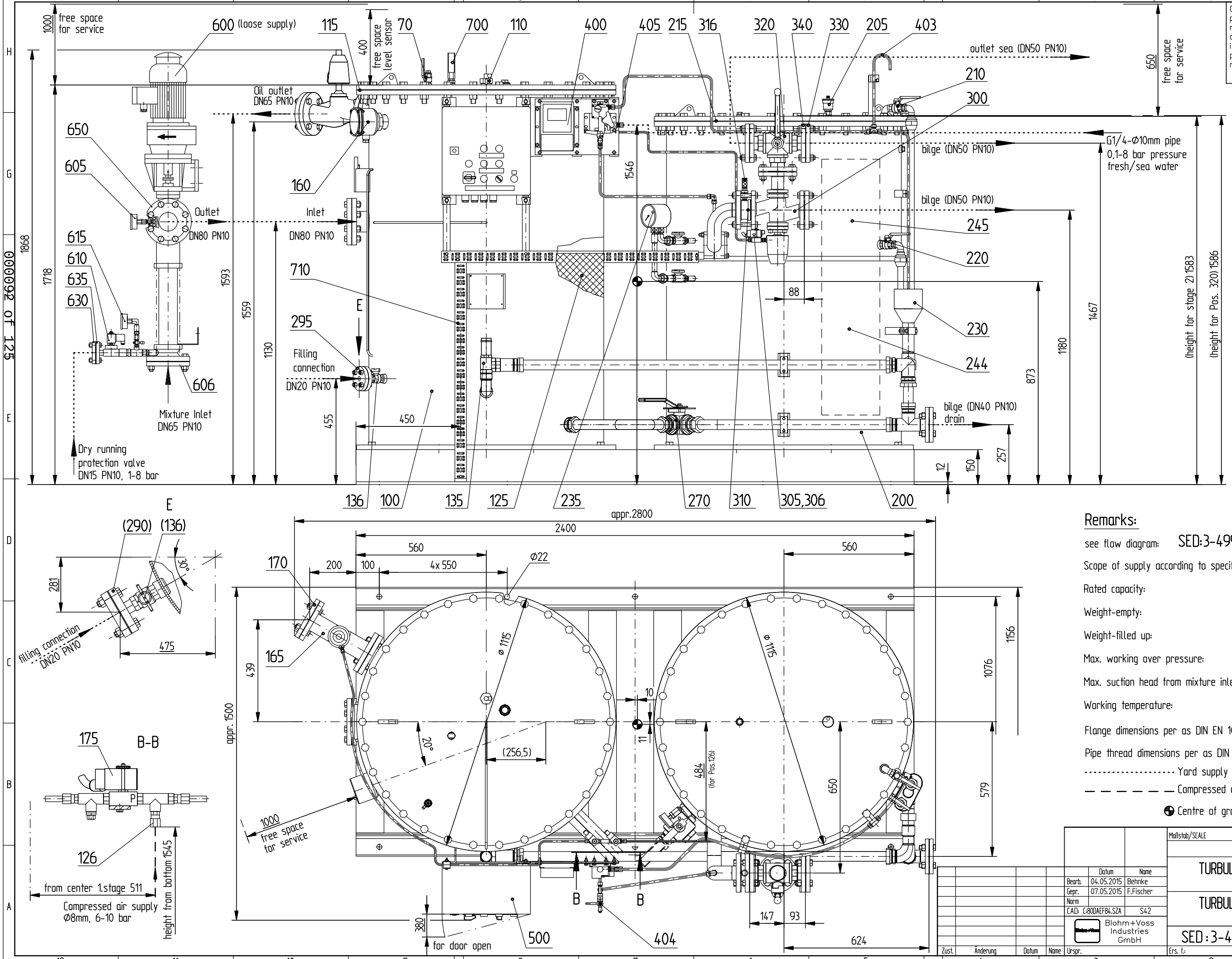
4.6 Gear

Pump_Getriebe/Gear			
Pos	Qu	Discription:	Beschreibung
G1	1	Drive Shaft	Antriebswelle
G3	1	Shaft Seal	Wellendichtung
G5	1	Ball Bearing	Kugellager
G6	1	Ball Bearing	Kugellager
G10	1	Driving Wheel	Antriebsrad
G14	1	Driving Pinion	Antriebsritzel
G16	1	Ball Bearing	Kugellager
G17	1	Driving Pinion	Antriebsritzel
G19	1	Driving Wheel	Antriebsrad
G23	1	Ball Bearing	Kugellager
G30	1	Sealing	Dichtung
G31	1	Sealing	Dichtung

Table **4**-8:. Pos discription of the gear

Chapter 3

Drawings



Remarks:

see flow diagram: SED:3-499-0525-000.

Scope of supply according to specification of manufacturer

Rated capacity:	10 m³/h
Weight-empty:	1850 kg
Weight-filled up:	4130 kg
Max. working over pressure:	3,5 bar
Max. suction head from mixture inlet:	-0,6 bar
Working temperature:	+15°C to +60°C

Flange dimensions per as DIN EN 1092, PG.1; PN10

Pipe thread dimensions per as DIN 2999, PG1

---------- Yard supply (piping tubing)

— — — — — Compressed air aupply connection

Centre of gravity

	Datum	Name
Bearb.	04.05.2015	Behnke
Gepr.	07.05.2015	F.Fischer
Norm		
CAD: C:80DAEF84.SZA		S42

Blohm+Voss Industries GmbH

Maßstab/SCALE %

Gewicht/WEIGHT

TURBULO SEPARATOR 10m³/h

TURBULO SEPARATOR 10m³/h
MEPC 107 (49)

SED:3-495-0494-000 0

Blatt 0
Blattz.

Zust. | Änderung | Datum | Name | Urspr. | Ers. f.: | Ers. d.:

12.05.2015

Einzelteilliste PARTS LIST				SKF Blohm+Voss Industries Page 1 of 2
Turbulo Entöler Größe: 10t **TURBULO SEPARATOR** SIZE		Zeichnungs-Nr. **SED:3-495-0494-000.0** DRAWING-N°		
Pos. POS.	Anzahl NO.	Benennung NAME	Zeichnungs-Nr./DIN DRAWING-N°	Werkstoff MATERIAL
70	1	Entlüftungshahn G1/2 Vent cock	SEZ:4-489-2007-000. SAP:155375	CuZn39 Brass
100	1	Entölergehäuse,1.Stufe Separator housing,1.stage		St Steel
110	1	Ölstandssonde G1 Probe for oil level	SEZ:4-489-2008-000. SAP: 163808	Messing/1.4571 Brass/stainless steel
115	1	Deckeldichtung Cover sealing	SAP: 163675	NBR70 Sh Perbunan
125	4	Koaleszer Typ HEC Coalescer Type HEC	SAP: 163646	
126	1	Einschraubverschraubung G1/8-Ø8 Connection	DIN 2553 SAP: 109559	2.0540 Copper
135	1	Sicherheitsventil G1 1/4 Safety valve	SEZ:4-489-2203-000. SAP: 176900	Messing Brass
136	1	Füllhahn G3/4 Filling cock	SEZ:4-489-2007-000. SAP: 164133	CuZn 39 Brass
160	1	Einschraubheizkörper G1 1/2 Electic heating	SEZ:4-489-2004-000. SAP: 163508	1.4571 Stainless steel
165	1	Ölablaßventil DN 65 Oil discharge valve	SEZ:4-489-2012-000. SAP: 164198	EN-GJL-250 Cast iron
170	1	Gegenflansch DN 65 Counter flange	SEZ:4-489-2020-000. SAP: 109956	St Steel
175	1	Pilotventil Solenoid valve	SEZ:4-489-2028-000. SAP: 164200	Messing Brass
200	1	Entölergehäuse,2.Stufe Separator housing,2.stage		St Steel
205	1	Entlüftungsventil G3/8 Vent valve	SEZ:4-489-2013-000. SAP: 164214	Messing Brass
210	1	Restölhahn obere Section G3/4 Rest oil drain upper section	SEZ:4-489-2007-000. SAP: 164133	CuZn 39 Brass
215	1	Deckeldichtung Cover sealing	SAP: 163675	NBR70 Sh Perbunan
220	1	Restölhahn untere Section G3/4 Rest oil drain lower section	SEZ:4-489-2007-000. SAP: 164133	CuZn 39 Brass
230	1	Trichter G1 1/2 Funnel	SAP: 104627	NDPE Plastic
235	1	Differenzdruckmessgerät G1/2-Ø100 Pressure Gauge	SAP: 177079	Messing Brass
244	9	HycaSep Tiefenfiltereinheit TORC, unten HycaSep Deep filtration unit TORC, lower part		
245	9	HycaSep Element geteilte Version, oben HycaSep Element Split Version, top		
270	1	3-Wege Kugelhahn G1 1/2 3-way ball-valve	SEZ:4-489-2035-000.	Messing/1.4571 Brass/stainless steel
290	1	Gewindeflansch DN20 Threaded flange	SEZ:4-489-2021-000. SAP: 153950	1.0038 Steel
295	1	Gegenflansch DN20 Counter flange	SEZ:4-489-2020-000. SAP: 115595	1.0038 Steel
300	1	3/2-Wegeventil DN 50 Three way valve bilge-sea	SEZ:4-489-2038-000. SAP: 164113	Rotguss Red brass
306	1	Aufsteckdiode 24V 3-way valve indication	SAP: 120608	
305	1	Pilotventil Solenoid valve	SEZ:4-489-2028-000. SAP: 164200	Messing Brass
310	1	Druckhalteventil DN 50 Pressure retaining valve	SEZ:4-489-2039-000. SAP: 149002	Rotguss Red brass
316	1	Belüftungsventil Vent valve	SEZ:4-489-2051-000. SAP: 105341	Messing Brass
320	1	Recirculationeinheit nach MEPC G2 Recirculation facility/MEPC	SEZ:4-489-2132-000. SAP: 182814	Messing/1.4571 Brass/stainless steel

Einzelteilliste PARTS LIST				SKF Blohm+Voss Industries Page 2 of 2
Turbulo Entöler **TURBULO SEPARATOR**	Größe: 10t SIZE	Zeichnungs-Nr. **SED:3-495-0494-000.0** DRAWING-N°		
Pos. POS.	Anzahl NO.	Benennung NAME	Zeichnungs-Nr./DIN DRAWING-N°	Werkstoff MATERIAL
330	3	Gegenflansch DN 50 Counter flange	SEZ:4-489-2020-000. SAP: 109958	1.0038 Steel
340	2	Gewindeflansch DN 50 Threaded flanges	SEZ:4-489-2021-000. SAP: 153953	1.0038 Steel
400	1	Ölgehaltmessgerät 15ppm Oil monitor	SAP:184844	
403	1	Vakuum-Brecher Ø10x1 Vacuum breaking pipe	SAP: 106507	Cu Copper
404	1	Probeentnahmehahn Sampling cock	SEZ:4-489-2027-000. SAP: 105257	Messing Brass
405	1	Spülwasseranschluß Meßgerät G1/4-Ø10 Flushing water connection	SAP: 115467	Messing Brass
500	1	Schaltkasten Switchbox	SEZ:4-448-0708-000.3	St Steel
600	1	Exzenterschneckenpumpe TSP10 Eccentric helical rotor pump	SEZ:4-450-0306-000.	EN-GJL-250 Cast iron
605	1	Manometer-Druckseite G1/4-Ø63 Manometer	SAP: 176622	1.4571 stainless steel
606	1	Gegenflansch DN65 Counter flange	SEZ:4-489-2020-000. SAP:109956	1.0038 Steel
610	1	Trockenlaufschutzventil G1/2 Protection valve against dry running	SEZ:4-489-2024-000. SAP: 164259	Messing/1.4571 Brass/stainless steel
616	1	Gegenflansch DN80 Counter flange	SEZ:4-489-2020-000. SAP:109938	1.0038 Steel
615	1	Manometer-Saugseite G1/4-Ø63 Manometer	SAP: 176501	1.4571 stainless steel
630	1	Gegenflansch DN15 Counterflange	SEZ:4-489-2020-000. SAP: 110245	1.0038 Steel
635	1	Gewindeflansch DN15 Threadedflange	SEZ:4-489-2021-000. SAP: 153949	1.0038 Steel
700	1	Thermometer G1/2 Thermometer	SEZ:4-489-2018-000. SAP: 107491	St Steel
710	1	Kabelbahn Cable tray	A 50 SAP: 124392	St TZN Steel

Remark:
Before start 1st and 2nd stage to be filled up by seawater/ fresh water

Pos.500
Switch Box

Main power supply

Pos.403
Oil Monitor and Recording
Pos.400
Sample inlet
G1/4-Ø10mm pipe
0,1-8 bar pressure
fresh/sea water

Pos.175
E
Compr. air supply
Ø8 mm pipe

Pos.600
Suction hight:-6m
Pos.615
mixture inlet
DN65
PN10
from bilge / holding tank
strainer
mesh size
□ 8 mm

normal closed (NC)
P
Pos.70
Pos.110
Pos.160
Electric heating
Oil outlet
DN65
PN10
Pos.165
DN80
PN10
Pos.605
Pos.125
Pos.136
Filling connection
E
normal closed (NC)
Pos.610
DN15/PN10
1-8 bar pressure
sea/fresh/ water

Pos.100
Separator first stage

Pos.135

Pos.205
Pos.210
Pos.404
Pos.235
Pos.270
Pos.220
Pos.230
Pos.200
Separator second stage
DN40
PN10
Drain/
Bilge

3-Way cock in accordance with MEPC 107(49)
Sea DN50
PN10
Pos.320
Bilge
DN50
PN10
Pos.316
Pos.310
Bilge DN50
PN10
Pos.305
E
P
Pos.300

Yard supply / task	B+V supply
Pipe	Pipe, cable or compr. air pipe
cable	
compr. air pipe	

					Datum	Name
				Bearb.	11.05.2015	Behnke
				Gepr.	11.05.2015	Plaass
				Norm		
				CAD: C:283B7E9F.SZA		S42
				SKF Blohm+Voss Industries GmbH		
Zust.	Änderung	Datum	Name	Urspr.		

Maßstab/SCALE %
Gewicht/WEIGHT

TURBULO MPB 10

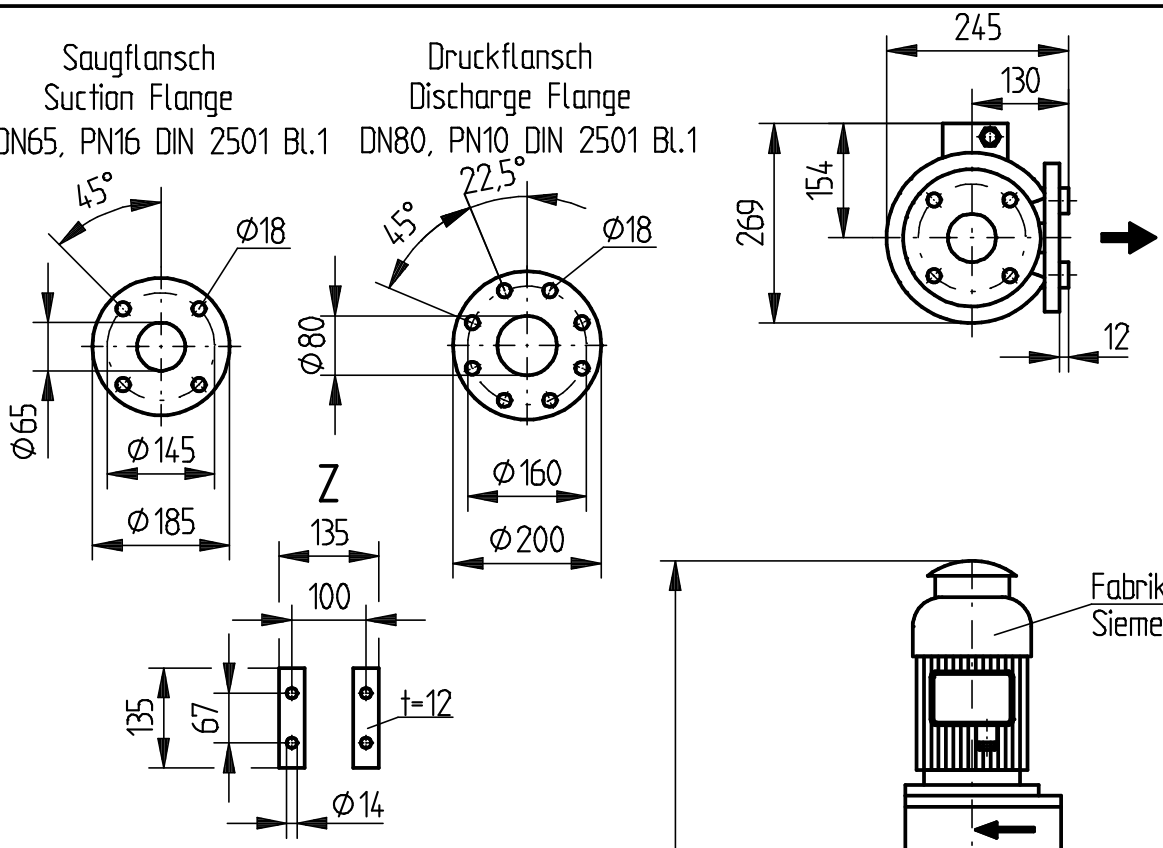
Flow diagram

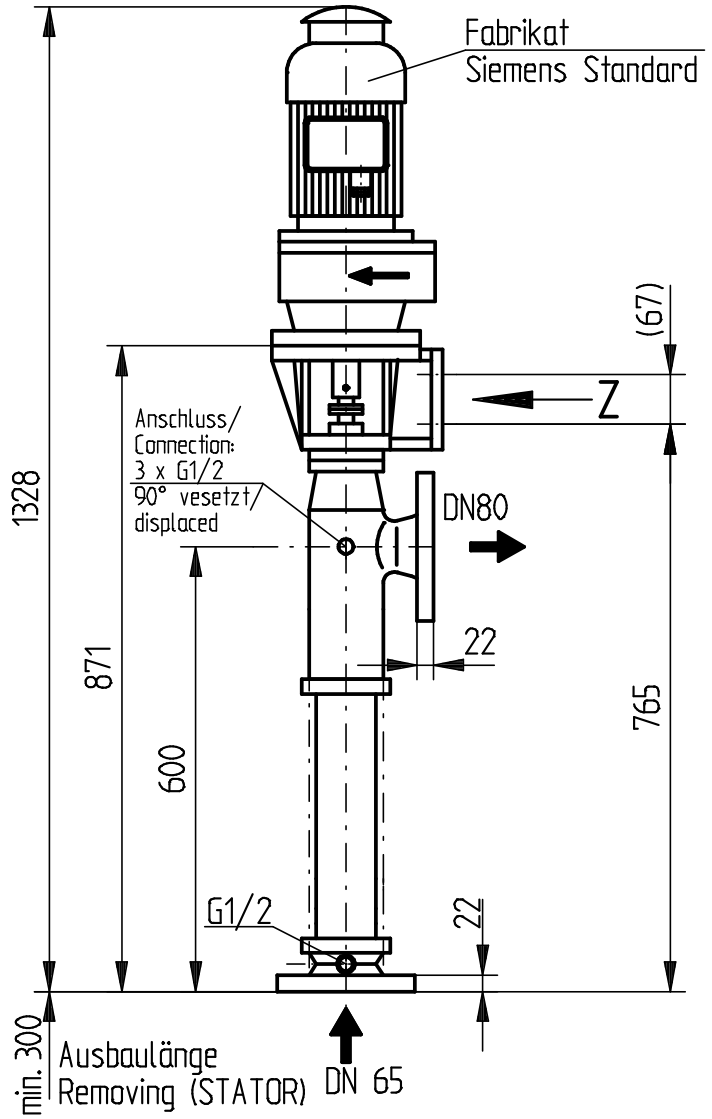
SED:3-499-0525-000. 0
Blatt 0
Blattz.
Ers. f.:
Ers. d.:

4000095 of 125
11.05.2015

Saugflansch
Suction Flange
DN65, PN16 DIN 2501 Bl.1

Druckflansch
Discharge Flange
DN80, PN10 DIN 2501 Bl.1





Das Pumpengehäuse mit Druckstutzen kann um jeweils 90° nach links oder rechts gedreht werden.
Pump casing with pressure socket can be turned by 90° to the left and to the right.
Antrieb: Drehstromgetriebemotor
Drive: Three phase AC geared motor

Temperature rise: As specified in VDE 0530

Isolationsklasse für Wicklungen:
Insulation class for windings: F

Grenzübertemperatur für Wicklungen:
Max. permissable temperature rise for windings: 105 K

Höchstzulässige Dauertemperatur für Wicklungen:
Max. permissible continous temperature for windings: 155 ° C

Schutzart:
Protection type: IP 55

Q = 10 m^3/h

P_s = -0,6 bar pressure head = 3,3 bar

$\triangle P$ = 3,9 bar

P = 3 kW (50 Hz) / 3,45 (60Hz)

Gesamtgewicht/Total weight: 95 kg
n (max.) = ca./approx. 250 1/min

					Datum	Name
				Bearb.	09.08.2004	Werner
				Gepr.	29.03.2007	Behnke
				Norm		
4	Delta P geändert	29.03.2007	Sauer	CAD: C:496F0B68.SZA		
3	PN 16 geä.	10.01.2005	Beh.			
2	Delta P hinzu	06.12.2004	Sauer			
1	Stutzen G1/2 geä.	22.11.2004	Beh.			
Zust.	Änderung	Datum	Name	Urspr.		

B+V Industrietechnik GmbH

Maßstab %

Pos.600

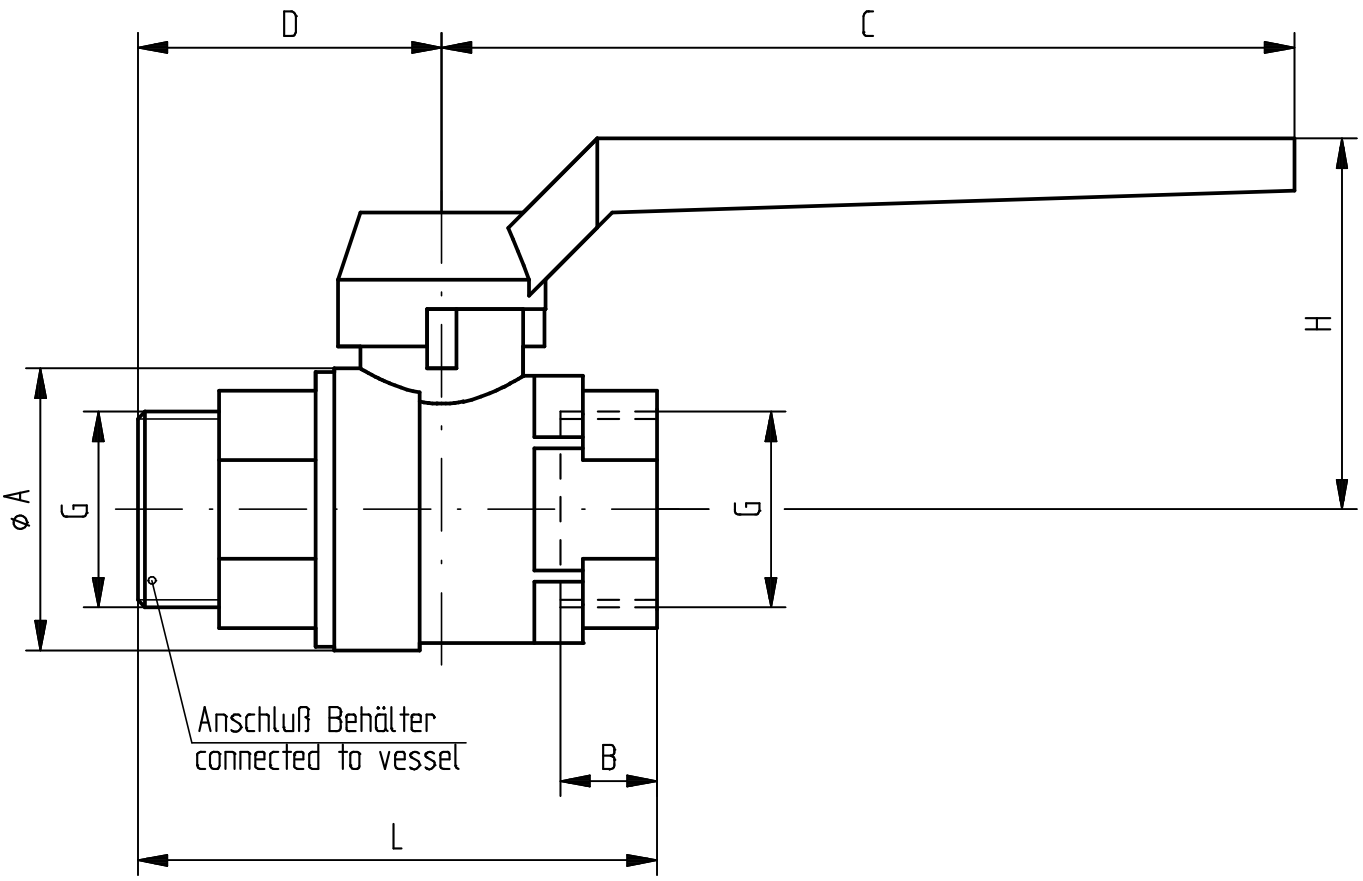
TSP 10
Exzenterschneckenpumpe
Eccentric helical rotor pump

SEZ: 4-450-0306-000.4

Blatt
Bl.

Ers. f.: Ers. d.:

23.05.2007



G	1/4	3/8	1/2	3/4	1
A [mm]	18	23	28	38	40
B [mm]	9	11	12	13	15
C [mm]	75	75	80	115	115
D [mm]	25	30	35	41	45
H [mm]	31	33	42	50	54
L [mm]	44	45	59	70	79
SAP:	174469		155375	164133	170634

Werkstoff/
material: CuZn39
Werkstoff-Nr./
material-no.: 2.0380
Gehäuse/
casing: Gal Ni
Kugel: Verchromt
ball: crome plated

Maßstab %

Pos.105,119,130,136,210,220,250,427,428,429

Zust.	Änderung	Datum	Name
4	G3/8 hinzu	04.07.2006	Sauer
3	G1/4 hinzu	19.06.2006	Sauer
2	G1 hinzu	26.10.2005	Sauer
1	Tabelle neu.	26.04.2005	Werne

	Datum	Name
Bearb.	14.09.2004	Sauer
Gepr.	04.07.2006	Behnke
Norm		
CAD: C:\3EB9EAD.SZA		MS 23

Blohm + Voss Industries GmbH

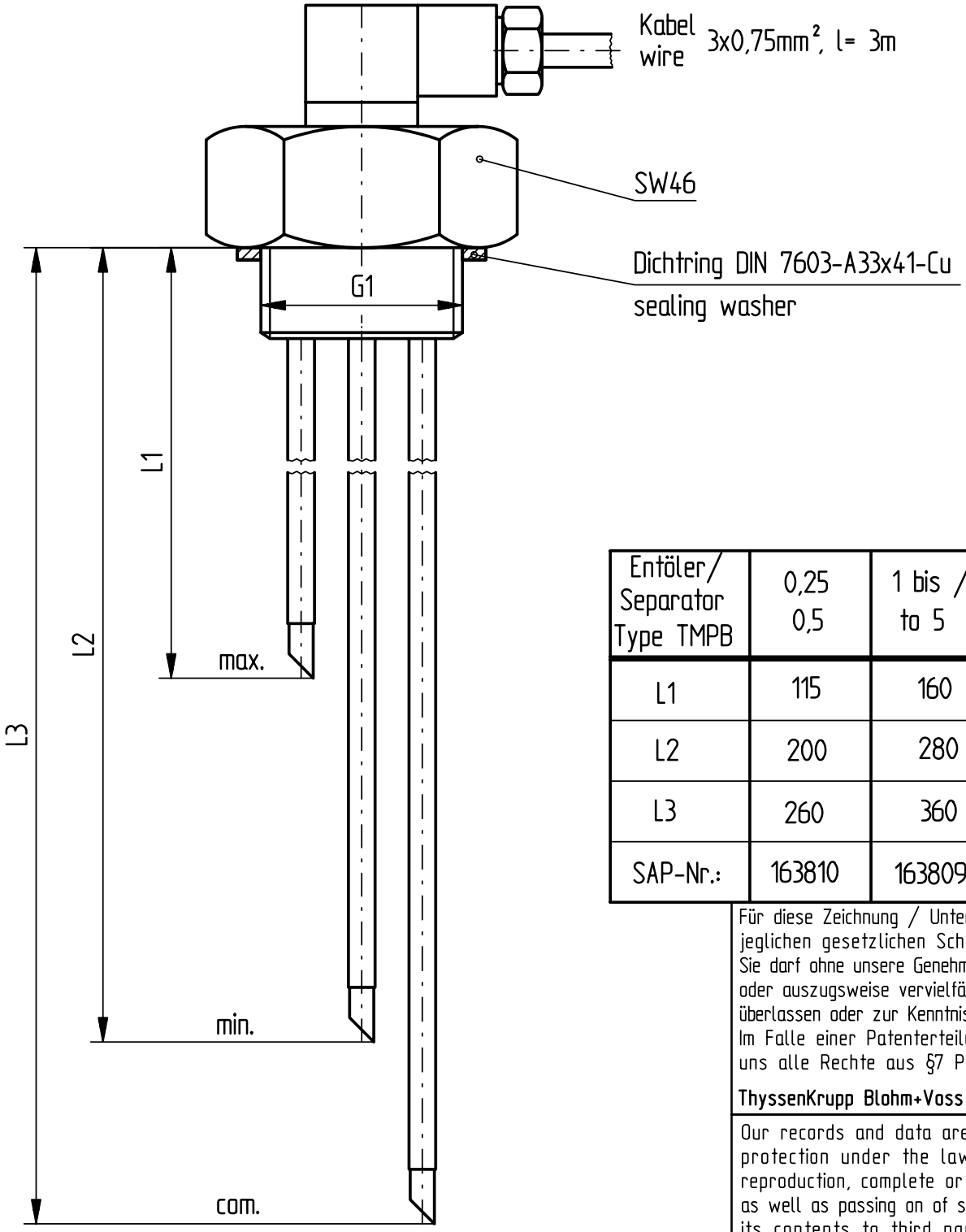
2-Wege Kugelhahn
2-way ball cock

SEZ: 4-489-2007-000.4

Blatt
Bl.

Urspr. | Ers. f.: | Ers. d.:

23.04.2009



Entöler/ Separator Type TMPB	0,25 0,5	1 bis / to 5	10
L1	115	160	180
L2	200	280	315
L3	260	360	400
SAP-Nr.:	163810	163809	163808

Maßstab %

Pos.110

	Datum	Name
Bearb.	14.09.2004	Sauer
Gepr.	01.11.2004	Behnke
Norm		
CAD: C:00009669.SZA		MS 23

Blohm + Voss Industries GmbH

Ölstandssonde
probe for oil level

SEZ: 4-489-2008-000.0

Blatt

Bl.

Zust.	Änderung	Datum	Name

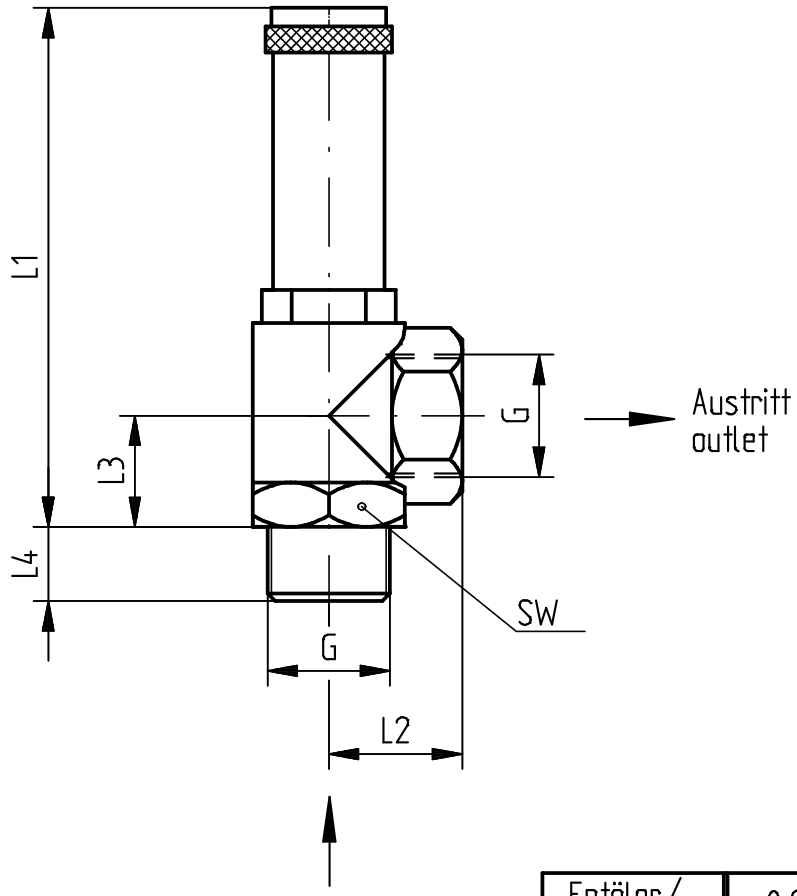
Urspr.

Ers. f.:

Ers. d.:

17.06.2006

Kegel durch Drehknopf anlüftbar.
The disc can be lifted and
turned for assuring proper action.



Entöler/ Separator Type TMPB	0,25 0,5 1	2,5	5	10
G	G1/2	G3/4	G1	G1 1/4
L1	74	108	140	150
L2	25	30	36	40
L3	20	25	30	35
L4	16	18,5	20	22
SW	27	32	41	50
SAP-Nr.:	180710	180709	176557	176900

Ansprechdruck: 3,5 bar
set pressure: 3,5 bar

Werkstoff / material:
Gehäuse/valve body: 2.1096.01
Federhaube/spring cover: 2.0380.10
Druckfeder/spring: 1.1200
Kegeldichtung/disc-seal: NBR
Membrane/diaphragm: NBR

Maßstab %

Pos.135,225

	Datum	Name
Bearb.	29.03.2007	Sauer
Gepr.	22.09.2008	F.Fischer
Norm		
CAD: C:BA2545ED.SZA		MS 25

Sicherheitsventil
safety valve

Zust.	Änderung	Datum	Name
2	SN hinzu	22.10.2008	Beh.
1	SN hinzu	10.05.2007	Beh.

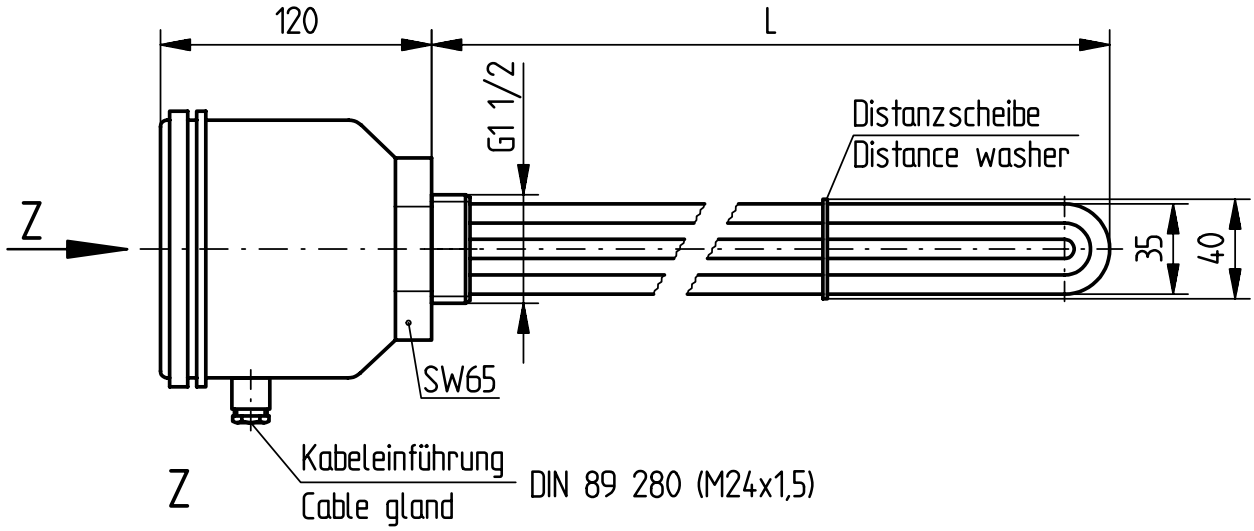
Blohm + Voss Industries GmbH

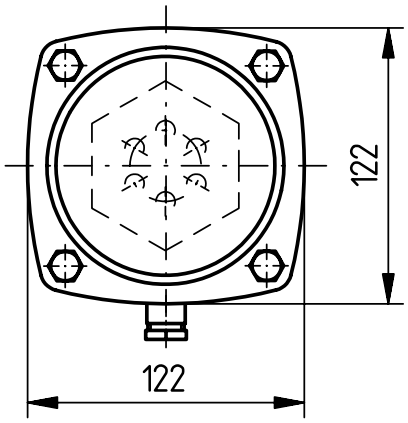
SEZ:4-489-2203-000. 2

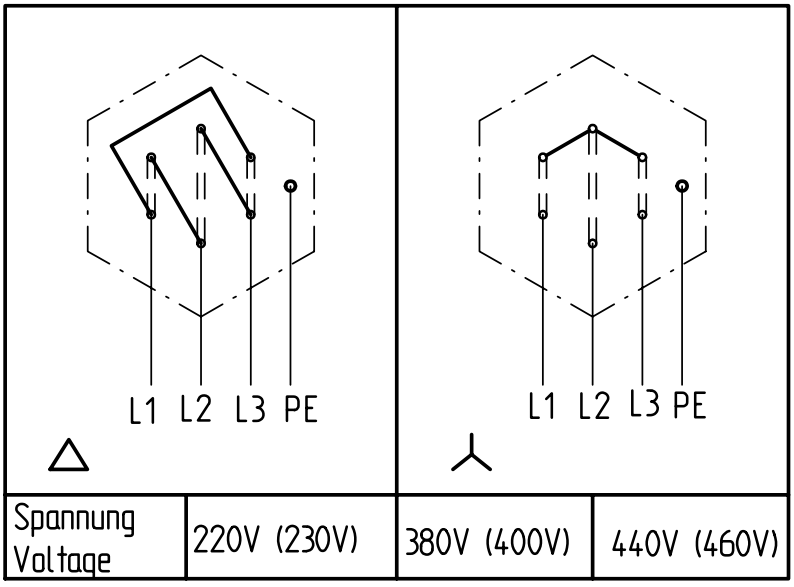
Blatt BL.

Urspr. | Ers. f.: | Ers. d.:

22. 10. 2008







Spannung Voltage	220V (230V)	380V (400V)	440V (460V)

Temperaturregler eingestellt auf
Temperature regulator adjusted to 60°C

Temperaturbegrenzer eingestellt auf
Temperature limiter adjusted to 85°C

Schutzart
Protection type IP54

Rohrmantelwerkstoff
Material of tubular casing 1.4571

Größe Size	Gewicht Weight	Leistung Consumption	Länge " L " Length	SAP
0,25 ; 0,5	1,9 kg	0,8 kW	350 mm	163910
1	1,6 kg	1,5 kW	300 mm	162992
2,5	2,6 kg	2 kW	490 mm	162993
5	3,3 kg	3 kW	650 mm	162994
10	5,1 kg	6 kW	950 mm	163508

Maßstab %

Pos.160

	Datum	Name
Bearb.	08.09.2004	Sauer
Gepr.	11.01.2007	Behnke
Norm		
CAD: C:045663A9.SZA		MS 23

Einschraubheizkörper
Electric heating

Blohm + Voss Industries GmbH

SEZ:4-489-2004-000.2

Blatt Bl.

Zust.	Änderung	Datum	Name
2	Gewichte nachgetragen	11.01.2007	Sauer
1	Länge 1T. geändert	30.11.2004	Sauer

Urspr. Ers. f.: Ers. d.:

11.01.2007

Entölergröße TMPB separator type TMPB	5 m³/h	10 m³/h
DN	50	65
Antrieb/actuator luft/air	150 ccm³	150 ccm³
Steuerluft/control air P min.	5 bar	6 bar
D	Ø165	Ø185
K	Ø125	Ø145
L	230	290
H approx.	255	275
Anzahl / number x d2	4xØ18	4xØ18
Gewicht / weight	15 kg	25 kg
SAP-Nr.	164197	164198

Bemerkungen/remarks:

Flanschabmessungen nach DIN 2501,Bl.1,PN10
flange dimensions per as DIN 2501,PG1,PN10

Ventil durch Federkraft geschlossen
valve closed by spring

Ventil durch Steuerdruck geöffnet
valve opened by contol air

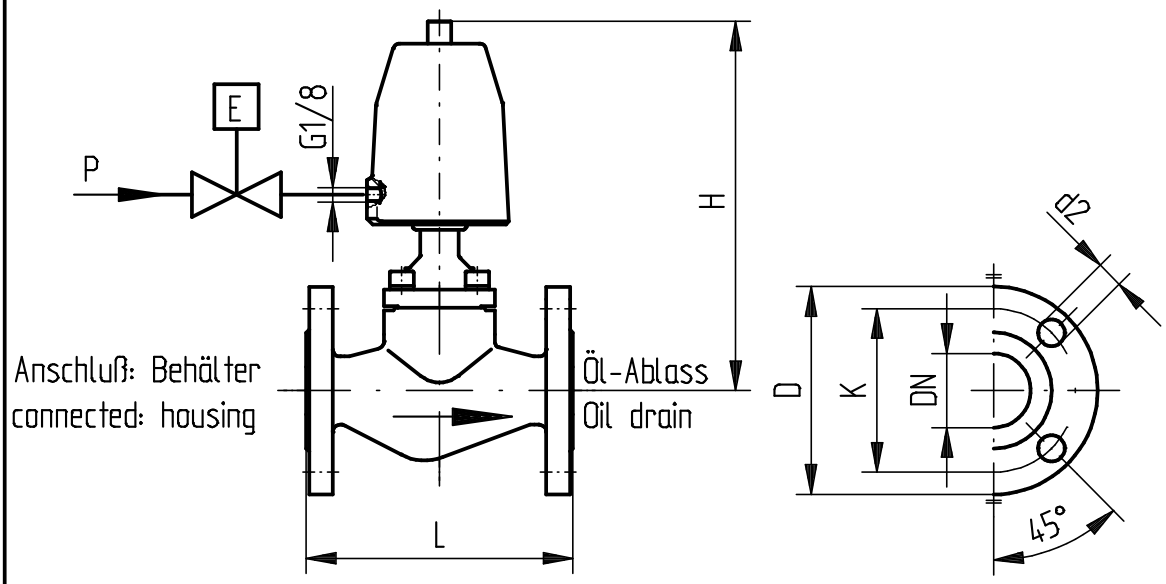
Ventil stromlos geschlossen (NC)
valve not energized closed (NC)

Werkstoff / material:

Gehäuse/casing: 0.6025

Innenteile/inner parts: 2.0410, 1.4104

Dichtung/seal: NBR



Maßstab %

Pos.165

Zust.	Änderung	Datum	Name
2	Maße H ergänzt	25.06.2007	Beh.
1	Text entnommen	29.03.2007	Sauer

	Datum	Name
Bearb.	17.09.2004	Sauer
Gepr.	25.06.2007	F.Fischer
Norm		
CAD: C:7C1AA0F7.SZA		MS 23

Blohm + Voss Industries GmbH

Ölablassventil
oil outlet valve

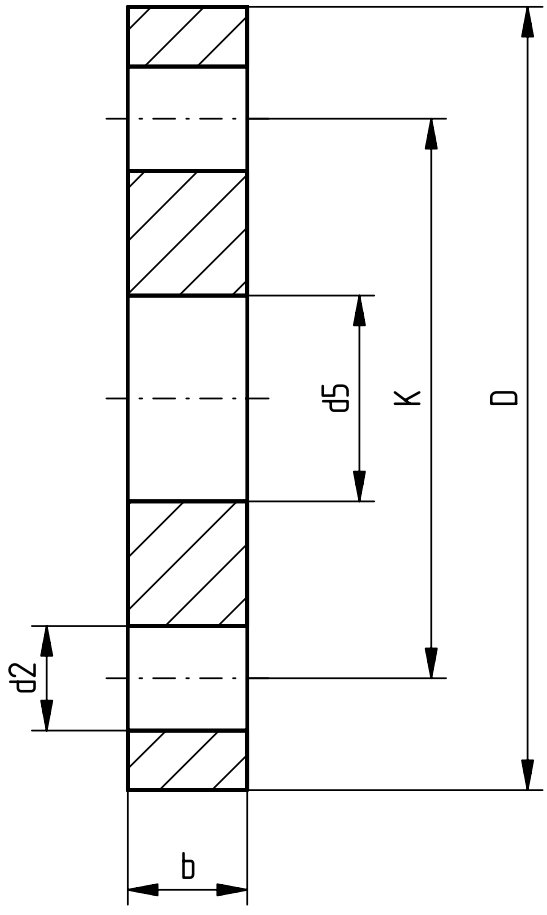
SEZ:4-489-2012-000.2

Blatt Bl.

Ursprung | Ers. f.: | Ers. d.:

25.06.2007

DN	D	K	d 5	b	Anzahl number d 2	Gewicht weight	SAP-Nr.
15	Ø95	Ø65	Ø22	14	4xØ14	0,67kg	110245
20	Ø105	Ø75	Ø27,6	16	4xØ14	0,93kg	115595
25	Ø115	Ø85	Ø34,4	16	4xØ14	1,11kg	109937
40	Ø150	Ø110	Ø49	16	4xØ18	1,85kg	109957
50	Ø165	Ø125	Ø61,1	18	4xØ18	2,47kg	109958
65	Ø185	Ø145	Ø77,1	18	4xØ18	2,70kg	109956
80	Ø200	Ø160	Ø90,3	20	8xØ18	3,79kg	109938



Werkstoff : 1.0038
material : steel

Maßstab %

TMPB

	Datum	Name
Bearb.	16.09.2004	Sauer
Gepr.	01.11.2004	Behnke
Norm		
CAD: C:00009737.SZA		MS 23

Blohm + Voss Industries GmbH

Maßblatt Gegenflansch
Measurement of counterflanges

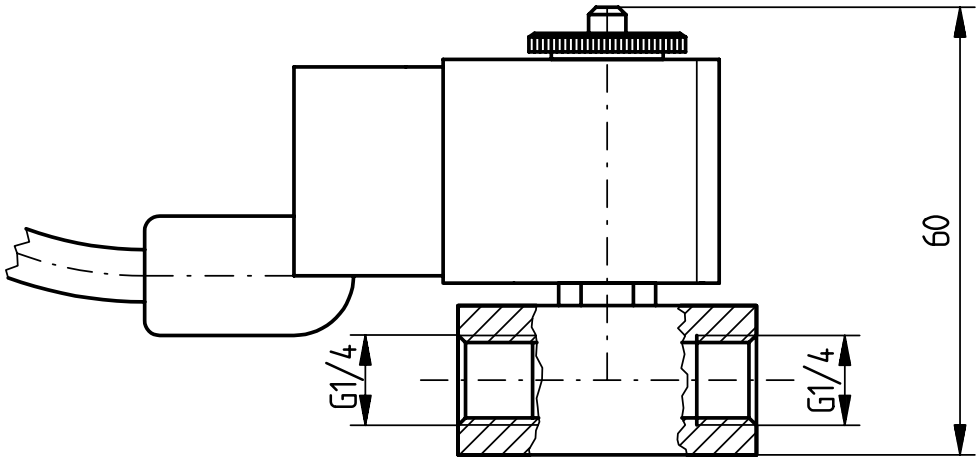
SEZ : 4-489-2020-000.0

Blatt Bl.

Zust.	Änderung	Datum	Name

Ursprung | Ers. f.: | Ers. d.:

24.06.2006



Werkstoff
Material

Ventilgehäuse : Messing / Brass
Valve body :

Steuerluft P min. 4 - 10 bar
Control Air

SAP: 164200
SAP: 176328

Maßstab %

Pos.175,305

	Datum	Name
Bearb.	12.10.2004	Werner
Gepr.	19.11.2004	Behnke
Norm		
CAD: C:00010125.SZA		MS 23

Blohm + Voss Industries GmbH

Pilotventil
Solenoid valve

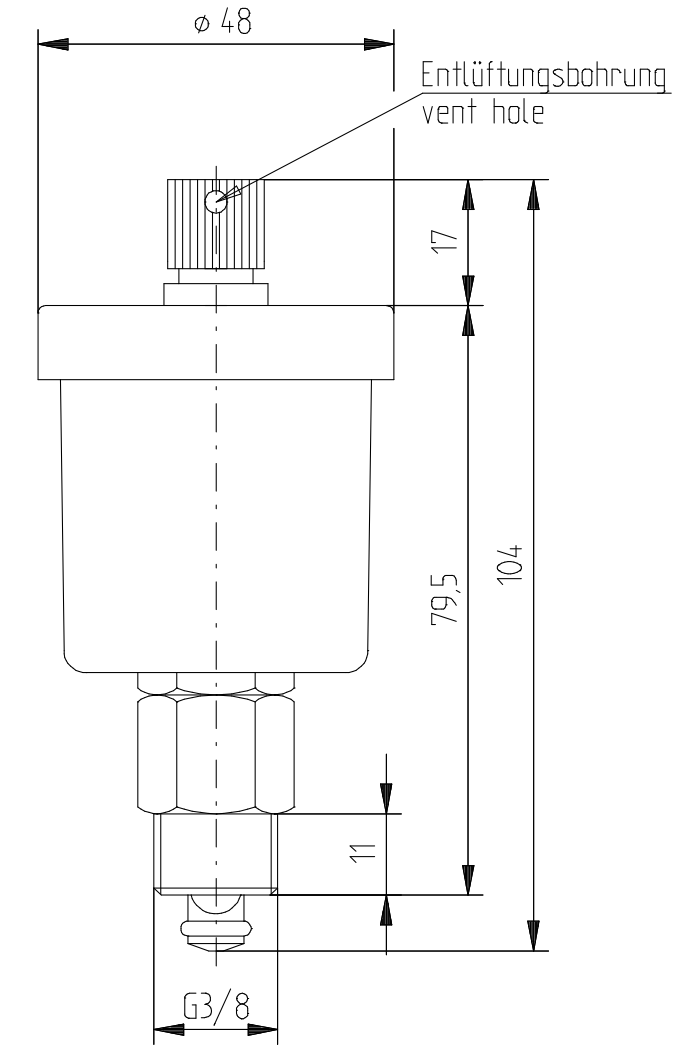
SEZ: 4-489-2028-000.0

Blatt
Bl.

Zust.	Änderung	Datum	Name

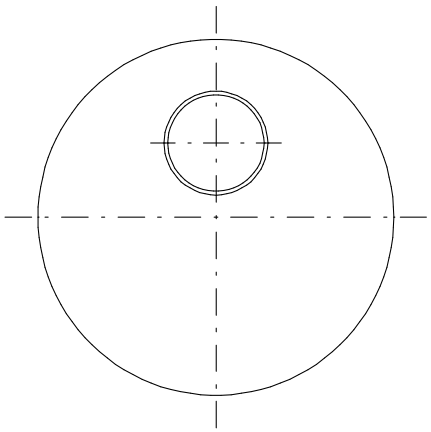
Ursprung: Ers. f.: Ers. d.:

23.02.2007



Werkstoff / material

Gehäuse / casing	MS 58
Dichtung / sealing	EPDM
Schwimmer / float	Polypropylen
Feder / spring	Edelstahl stainless steel



SAP: 164214

Maßstab/SCALE %

Gewicht/WEIGHT

Pos. 205

Entlüftungsventil

Vent valve

	Datum	Name
Bearb.	29.09.2004	Sauer
Gepr.	05.07.2011	F.Fischer
Norm		
CAD: C:5CB7FD54.SZA		S42

Blohm+Voss Industries GmbH

SEZ: 4-489-2013-000.1

Blatt 0

Blattz.

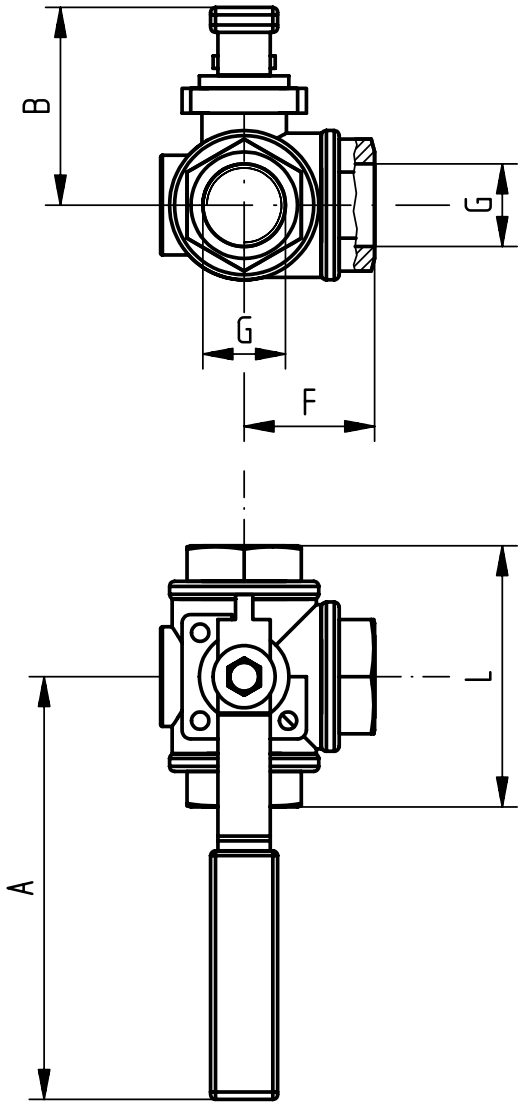
Zust.	Änderung	Datum	Name
1	Dimensions	05.07.2011	Beh.

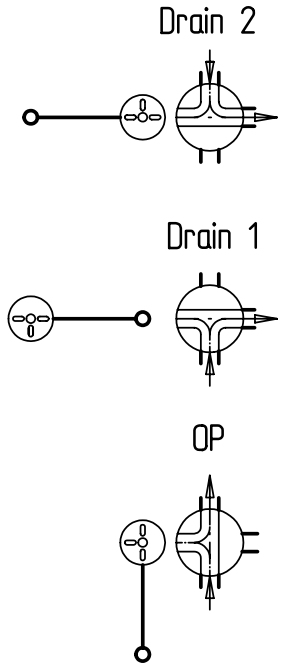
Urspr.

Ers. f.:

Ers. d.:

06.07.2011





Werkstoff : Gehäuse Ms/Ni
Material : casing

Kugel Ms/Cr
ball

Separator Typ TMPB	0,25 - 1	2,5	5	10
G	G1/2	G3/4	G1	G1 1/2
L [mm]	77	87	105	138,5
A [mm]	120	170	170	230
B [mm]	63,5	75	79,5	113,5
F [mm]	38,5	43,5	52,5	69,25
SAP	165616	165615	165114	165614

Maßstab %

Pos. 270

	Datum	Name
Bearb.	12.01.2005	Werner
Gepr.	28.01.2005	Behnke
Norm		
CAD: C:F7B77422.SZA		

Blohm + Voss Industries GmbH

3/2-Wege Kugelhahn
3/2-way ball cock

SEZ:4-489-2035-000. 0

Blatt

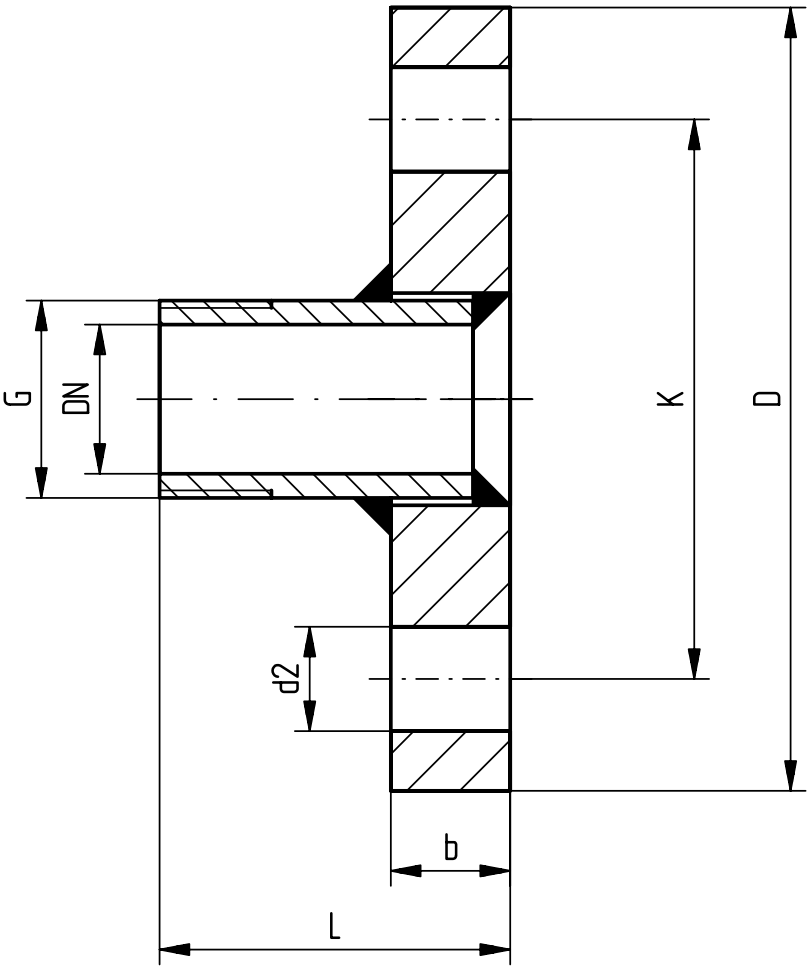
Bl.

Zust.	Änderung	Datum	Name

Ursprung: Ersatz f.: Ersatz d.:

17.06.2006

DN	G	D	K	L	b	Anzahl number d 2	Gewicht weight	SAP-Nr.
15	G1/2	Ø95	Ø65	44	14	4xØ14	0,78kg	153949
20	G3/4	Ø105	Ø75	47	16	4xØ14	1,11kg	153950
25	G1	Ø115	Ø85	50	16	4xØ14	1,42kg	153951
40	G1 1/2	Ø150	Ø110	57	16	4xØ18	2,58kg	153952
50	G2	Ø165	Ø125	59	18	4xØ18	3,65kg	153953
65	G2 1/2	Ø185	Ø145	61	18	4xØ18	4,65kg	153954



Werkstoff : 1.0038
material : steel

Maßstab %

TMPB

	Datum	Name
Bearb.	17.09.2004	Sauer
Gepr.	01.11.2004	Behnke
Norm		
CAD: C:00009742.SZA		MS 23

Blohm + Voss Industries GmbH

Maßblatt Gewindeflansch
Measurement of threadedflanges

SEZ : 4-489-2021-000.0

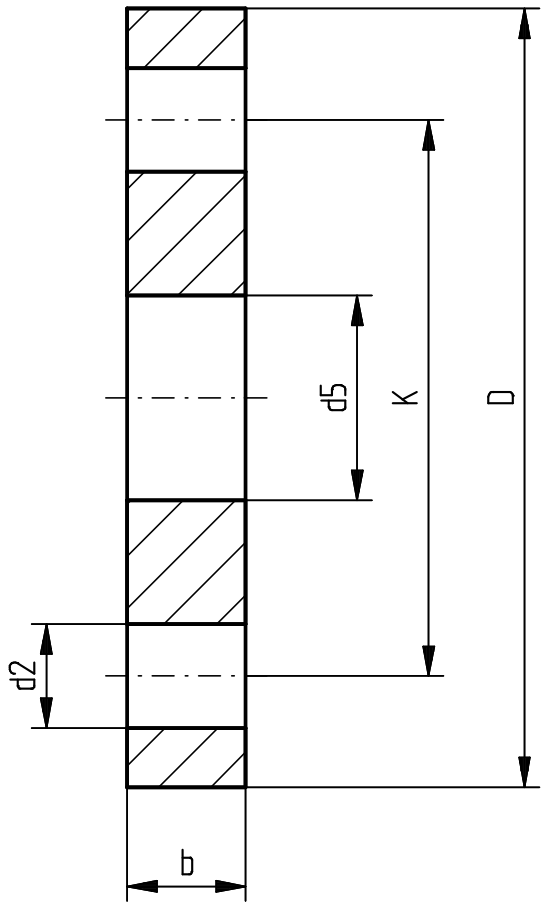
Blatt Bl.

Zust.	Änderung	Datum	Name

Urspr. | Ers. f.: | Ers. d.:

20.06.2006

DN	D	K	d 5	b	Anzahl number d 2	Gewicht weight	SAP-Nr.
15	Ø95	Ø65	Ø22	14	4xØ14	0,67kg	110245
20	Ø105	Ø75	Ø27,5	16	4xØ14	0,93kg	115595
25	Ø115	Ø85	Ø34,5	16	4xØ14	1,11kg	110254
40	Ø150	Ø110	Ø49,5	16	4xØ18	1,85kg	109957
50	Ø165	Ø125	Ø61,5	18	4xØ18	2,47kg	109958
65	Ø185	Ø145	Ø77,5	18	4xØ18	2,70kg	109956
80	Ø200	Ø160	Ø90,5	20	8xØ18	3,79kg	109938

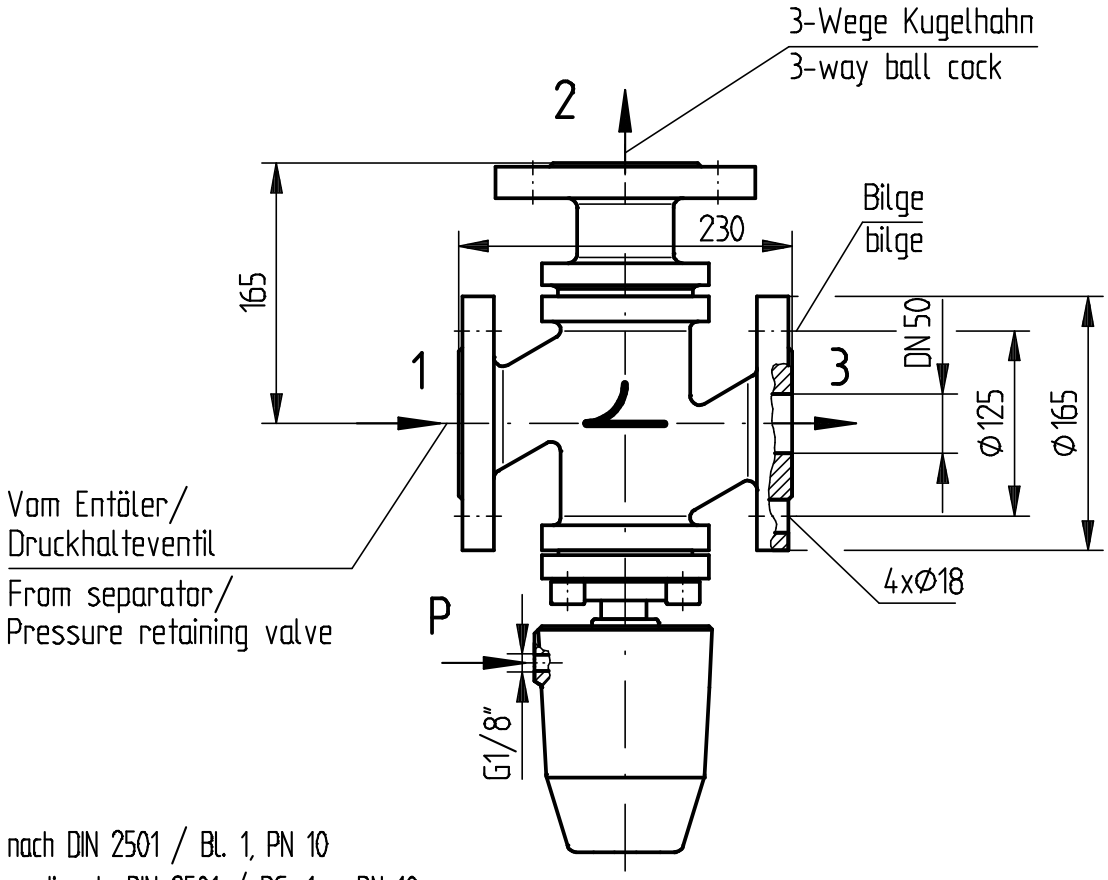


Werkstoff : 1.0038
material : steel

						Maßstab %	
						TMPB	
					Datum	Name	
				Bearb.	16.09.2004	Sauer	
				Gepr.	10.03.2010	Behnke	
				Norm			
				CAD: C:FBD2899C.SZA		MS 23	
				Blohm+Voss Industries GmbH		SEZ:4-489-2020-000.1	Blatt BL.
1	Maße geändert	10.03.2010	Bur				
Zust.	Änderung	Datum	Name	Urspr.		Ers. f.:	Ers. d.:

Maßblatt Gegenflansch
Measurement of counterflanges

10.03.2010



Flanschabmessungen nach DIN 2501 / Bl. 1, PN 10
Flange dimensions according to DIN 2501 / PG. 1 , PN 10

Bemerkung : Durch Federkraft 1-2 geschlossen, 1-3 geöffnet
Durch Steuerdruck 1-2 geöffnet, 1-3 geschlossen

Remark : Valve seat 1-2 closed by spring, 1-3 open
Valve seat 1-2 opened by air, 1-3 closed

Zulässiger Betriebsdruck für Armatur : max. 3 bar
Maximum working pressure (medium) for valve : max. 3 bar

Ventil stromlos geöffnet 1-3 = Normal Open (NO)
Valve not energized open 1-3 = Normal Open (NO)

Werkstoff :
Material :

Gehäuse : Casing : 0.6025

Innenteile : Inner parts : 2.0410 ; 1.4104

Dichtung: Seal : NBR

SEPARATOR TYP TMPB	10
DN	50
Antrieb / actuator Luft / air vol. (ccm)	150
Gewicht / weight (kg)	25,5
Steuerluft/contral air P min (bar)	5

SAP: 164113

Maßstab 1:4

Pos. 300

	Datum	Name
Bearb.	03.11.2004	Werner
Gepr.	28.09.2006	Sauer
Norm		
CAD: C:2A1B884A.SZA		MS 23

Ablassventil (Bilge/See)
Outlet valve (bilge/sea)

B+V Industrietechnik GmbH

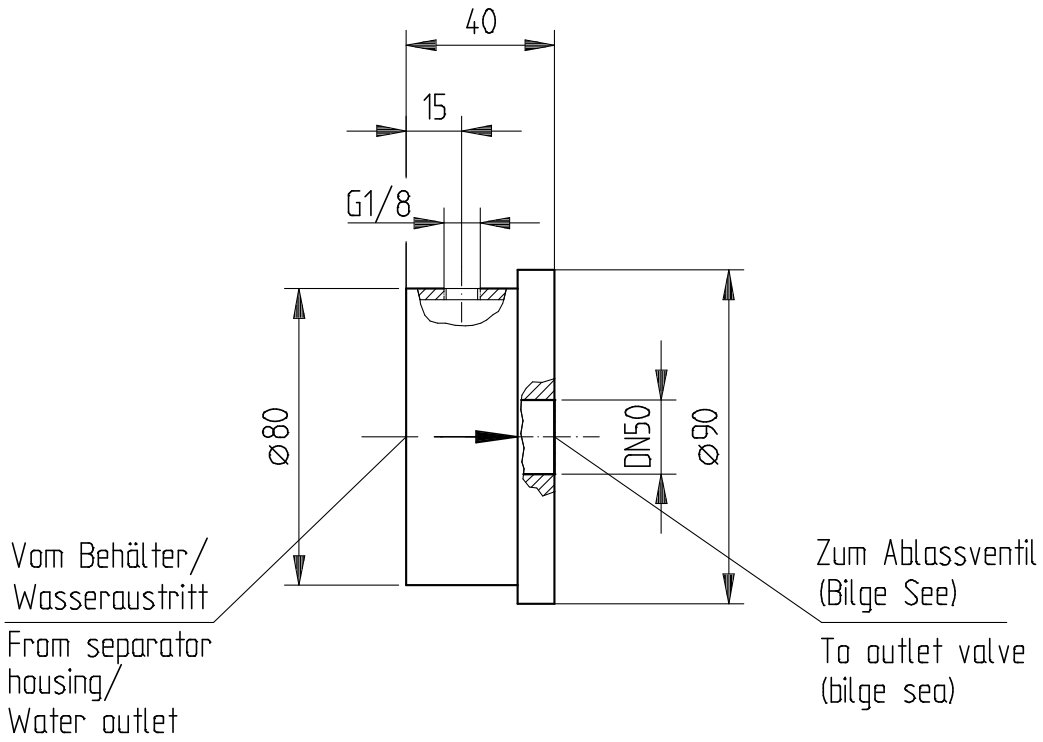
SEZ : 4-489-2038-000.1

Blatt BL.

Zust.	Änderung	Datum	Name
1	Symbol hinzu	28.09.2006	Chris

Ursprung: Ers. f.: Ers. d.:

28.09.2006



Bemerkung : Ventil durch Federkraft geschlossen
Oeffnungsdruck : 0,4 bar

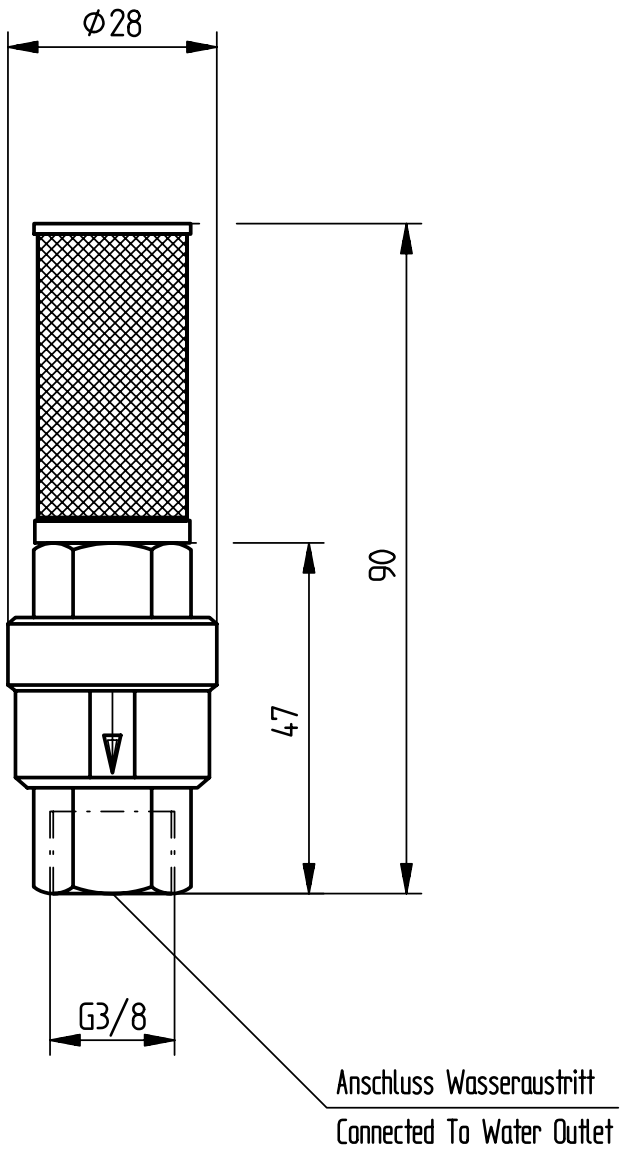
Remark : Valve close by spring
Opening pressure : 0,4 bar

Werkstoff : Gehaeuse Messing
Material : casing brass

Innenteile : Edelstahl
Inner parts : Stainless steel

SAP: 149002						Maßstab %	Weight: 1,1 Kg.
						Pos. 310	
					Datum	Name	Druckhalteventil Pressure retaining valve
				Bearb.	23.11.2004	Werner	
				Gepr.	22.04.2005	Behnke	
				Norm			
				CAD: C:6A5F47F7.SZA		MS 23	
				B+V Industrietechnik GmbH		SEZ: 4-489-2039-000.1	Blatt Bl.
1	Bahrung neu	22.04.2005	Werne				
Zust.	Änderung	Datum	Name	Urspr.		Ers. f.:	Ers. d.:

25.04.2005



Nenndruck Nom. Pressure	: :	PN 40
Werkstoff Material	: :	Ms / Brass
Dichtuing Seal	: :	NBR

Für alle Entölergrößen
For all separator dimensions

SAP: 105341

Maßstab 1:1

Pos. 316

	Datum	Name
Bearb.	21.04.2005	Werner
Gepr.	21.04.2005	Behnke
Norm		
CAD: F:58E344F5.SZA		

Belüftungsventil mit Saugkorb
Vent valve with suction basket

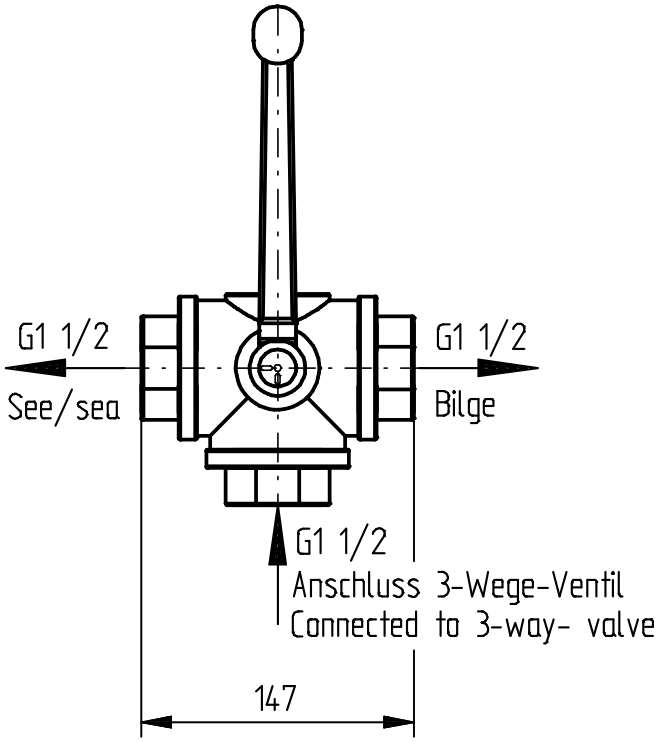
Blohm + Voss Industries GmbH

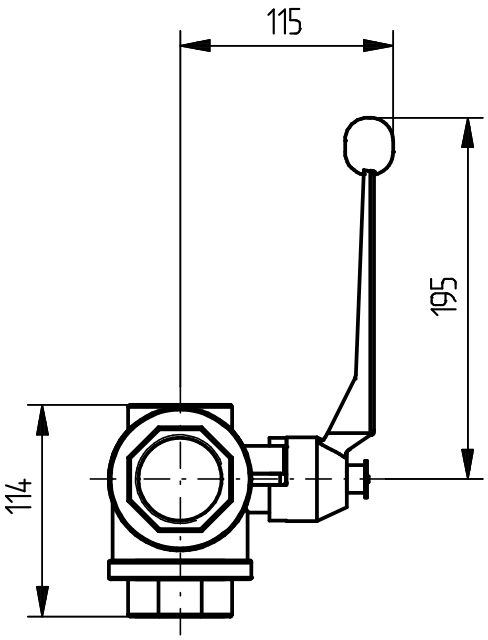
SEZ: 4-489-2051-000.0

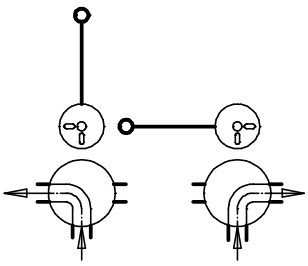
Blatt
Bl.

Zust.	Änderung	Datum	Name	Urspr.	Ers. f.:	Ers. d.:

17.06.2006







Werkstoff : Gehäuse Ms/Ni
Material : casing

Kugel Ms/Cr
ball

SAP: 174397

					Datum	Name
				Bearb.	16.06.2006	Sauer
				Gepr.	14.11.2012	F.Fischer
				Norm		
				CAD: C:5FF8B560.SZA		MS 23
1	Pfeilrichtung	14.11.2012	Beh.	Blohm+Voss Industries GmbH		
Zust.	Änderung	Datum	Name	Urspr.		

Maßstab/SCALE % Gewicht/WEIGHT

Pos.320

3-Wege Kugelhahn

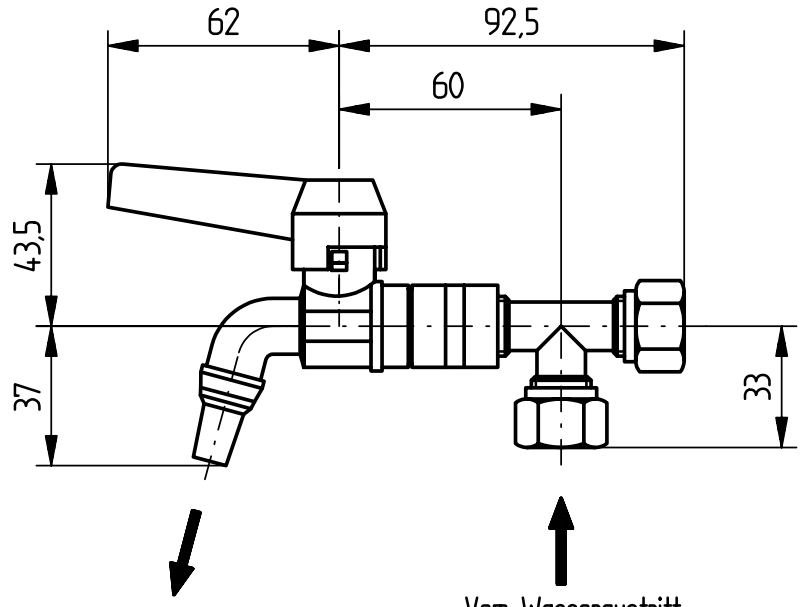
3-way ball cock

SEZ:4-489-2132-000.1

Blatt 0
Blattz.

Ers. f.: Ers. d.:

14.11.2012



Werkstoff :
MATERIAL : MS - VNI

Rohrdurchmesser :
PIPE DIAMETER : 10 mm / DN 8

SAP: 105257

Maßstab

	Datum	Name
Bearb.	07.10.2004	Sauer
Gepr.	06.04.2005	Behnke
Norm		
CAD: C:00010054.SZA		MS 23

Blohm + Voss Industries GmbH

Probeentnahmehahn
Sampling cock

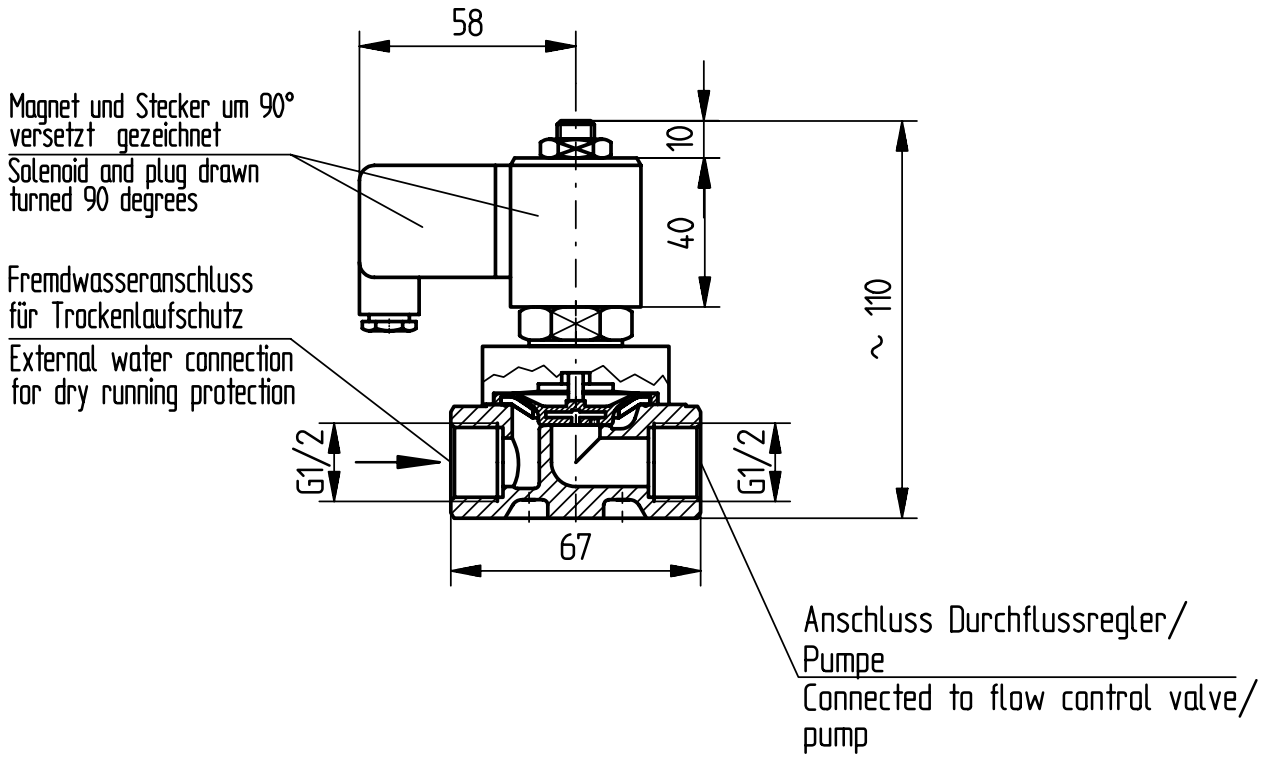
SEZ : 4-489-2027-000.0

Blatt

Bl.

Zust.	Änderung	Datum	Name	Urspr.	Ers. f.:	Ers. d.:

17.06.2006



Für alle Entölergrößen
For all separator dimensions

Note : Valve seat closed by spring.
Valve seat opened by energized solenoid.
Valve non energized closed = Normal Closed (NC)

Hinweis: Durch Federkraft Ventilsitz geschlossen.
Durch Elektromagnet Ventilsitz geöffnet.
Ventil stromlos geschlossen = Normal Closed (NC)

Werkstoff :	Gehäuse	Messing
Material :	Casing	Brass
Innenteile :	Messing und NIRO	
Inner parts :	Brass and stainless steel	
Dichtung : Seal :	NBR	

SAP: 164259
SAP: 176329

Maßstab 1:2

Pos.610

	Datum	Name
Bearb.	04.11.2004	Werner
Gepr.	29.04.2005	Behnke
Norm		
CAD: C:47F87B03.SZA		MS 23

Trockenlaufschutzventil
Dry-run protection valve

Blohm + Voss Industries GmbH

SEZ : 4-489-2024-000.1

Blatt
Bl.

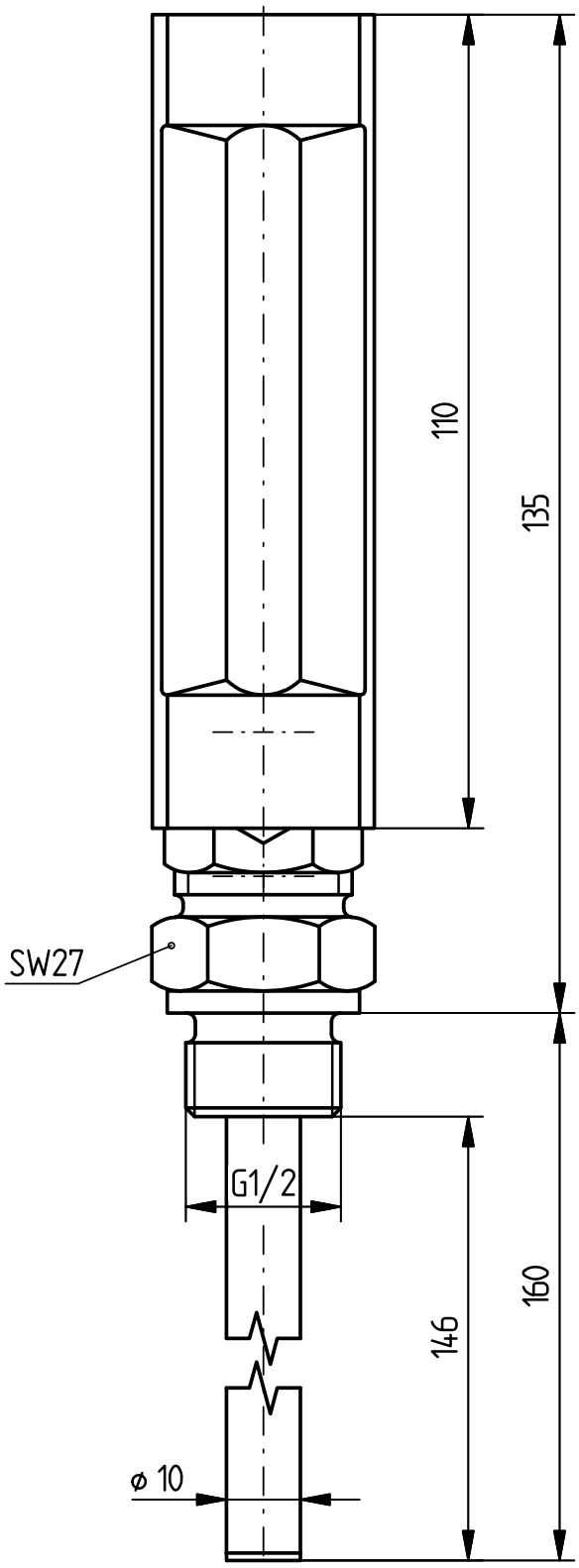
Zust.	Änderung	Datum	Name
1	Teilschnitt	29.04.2005	Werne

Urspr.

Ers. f.:

Ers. d.:

23.02.2007



Material: Brass
Thermometer DIN 16181-BG-100x160

SAP: 107491

Maßstab 1:1

Pos.700

	Datum	Name
Bearb.	17.09.2004	Sauer
Gepr.	06.07.2016	Lang
Norm		
CAD: C:24733482.SZA		S42

Thermometer G1/2

SKF Marine GmbH, Germany

SEZ: 4-489-2018-000.1

Blatt 0 Bl.

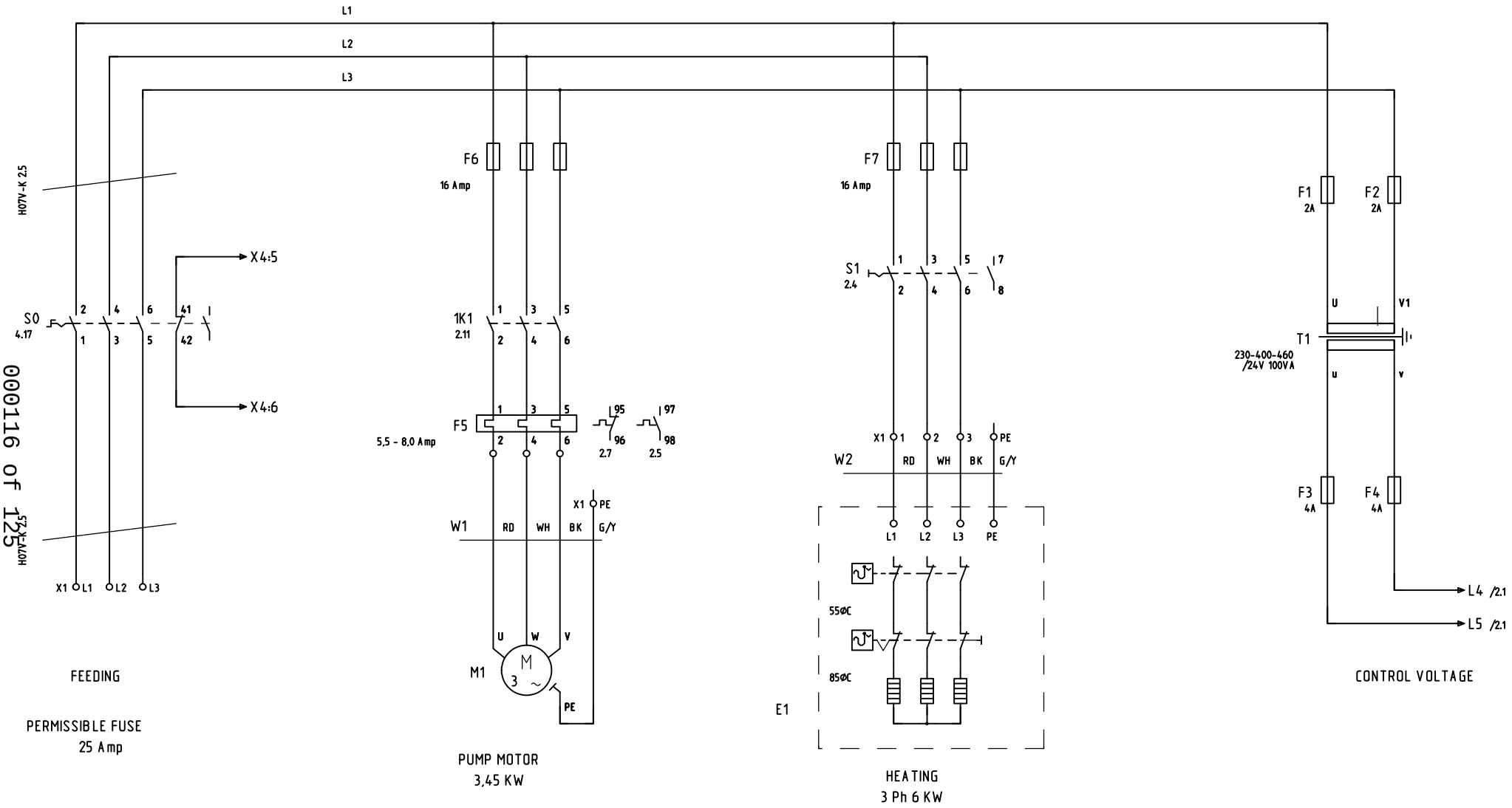
Zust.	Änderung	Datum	Name
1	Werkstoff erg.	06.07.2016	Lang

Urspr. | Ers. f.: | Ers. d.:

06.07.2016

Chapter 4

Wiring diagram

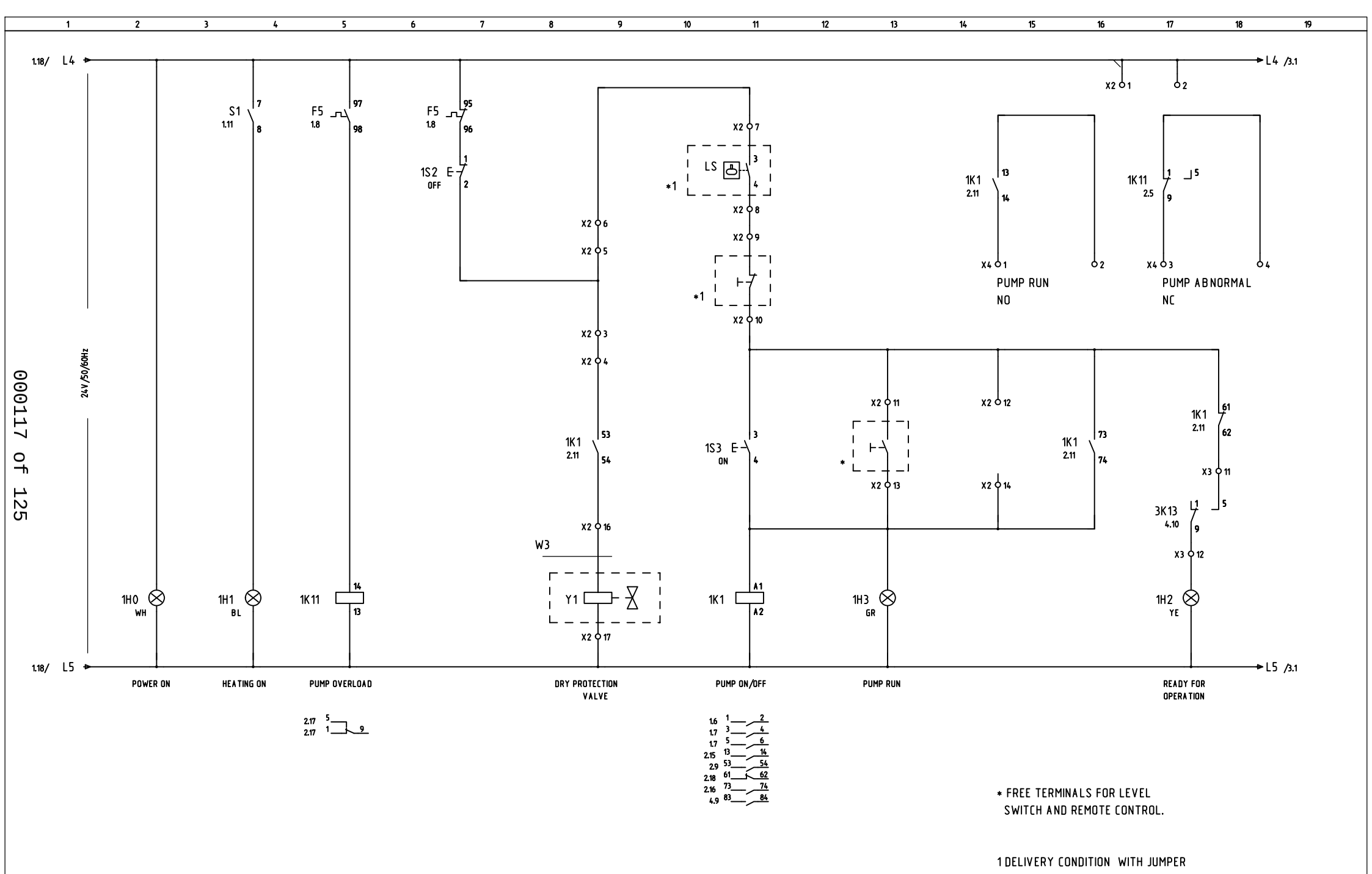


ALL THE NOT REMARKED LINES ARE H05V-K 1

000116 of 125

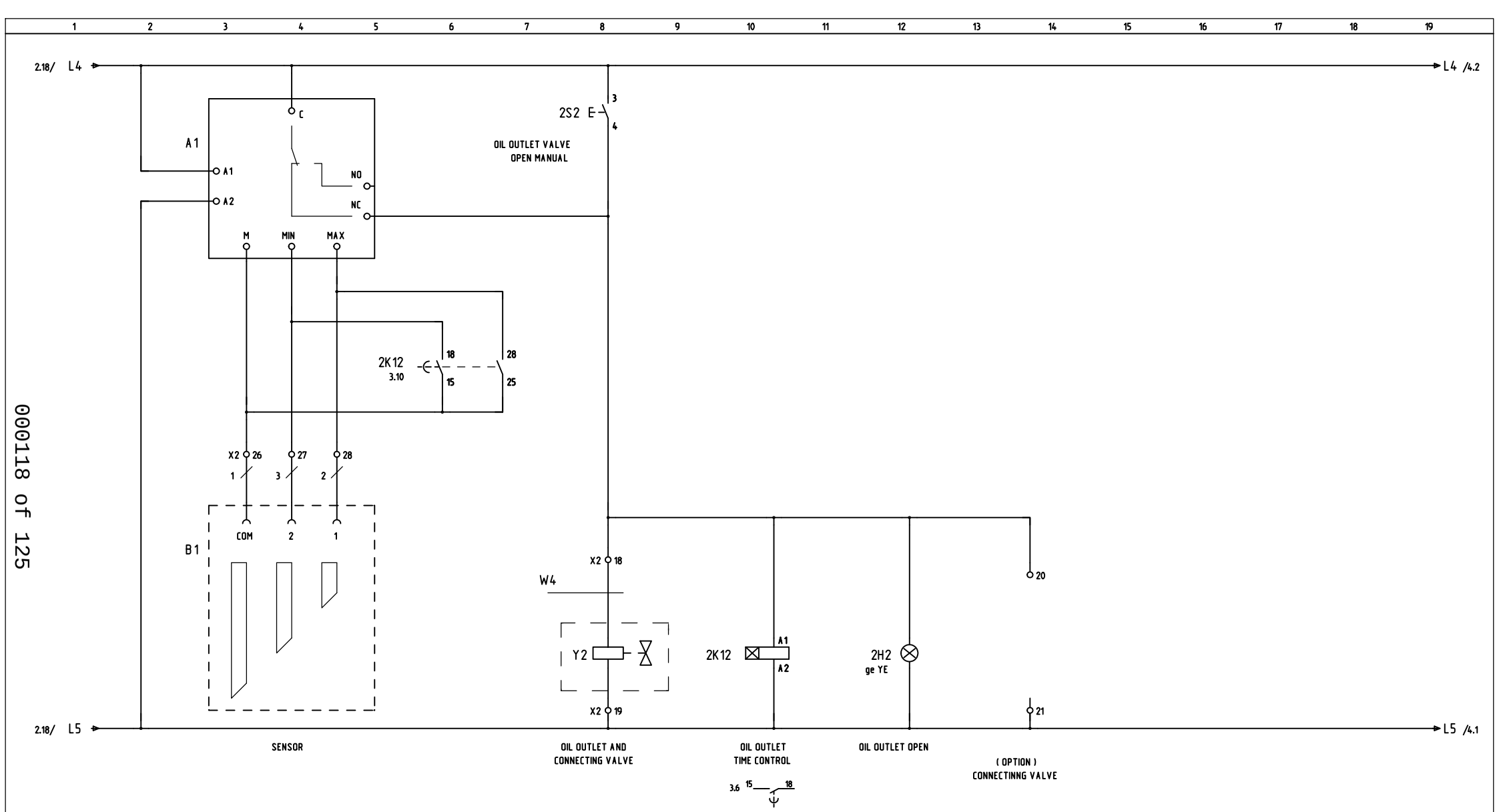
2

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM	SKF Blohm+Voss Industries GmbH	Leistungskreis POWER CIRCUIT	SEZ:4-448-0718-000.4	- / +
			Editor	K.Freitag					
			Verif.	18.Jun.2015				SEZ07184	Sh 1 / 10 Sh
Revn	Date	Name	Stdd		Origin / Repl.f.	Repl.by			



000117 of 125

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM	SKF Blohm+Voss Industries GmbH	Steuerkreis CONTROL CIRCUIT	SEZ:4-448-0718-000.4	- / +
			Editor	K.Freitag					
			Verif.	18.Jun.2015				SEZ07184	Sh 2 / 10 Sh
Revn	Date	Name	Stdd		Origin / Repl.f.	Repl.by			

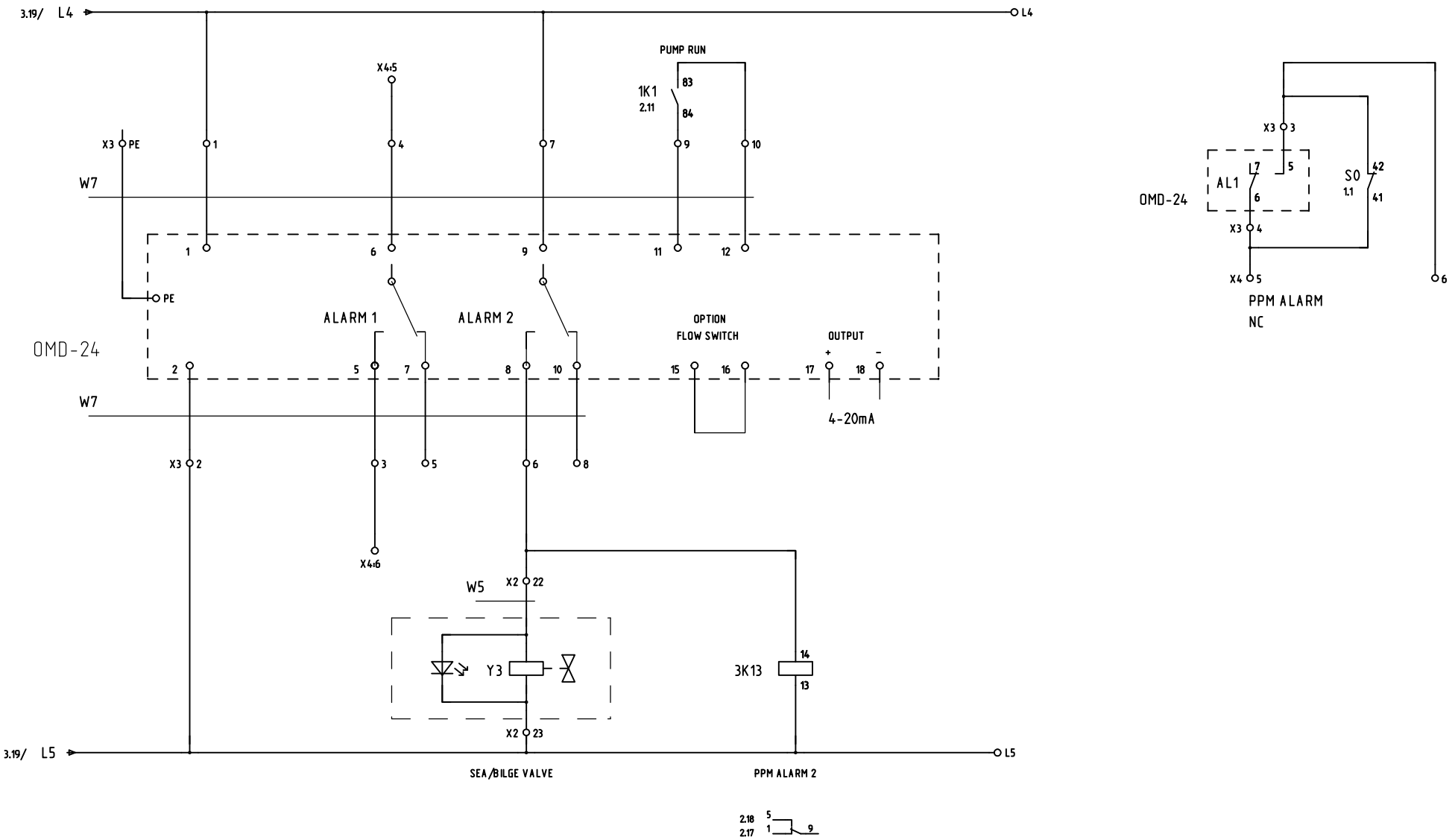


Alle nicht bezeichneten Leitungen H05V-K 1
ALL NOT REMARKED LINES ARE H05V-K 1

2

4

			Date	09.Mai.2015	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	Steuerkreis CONTROL CIRCUIT	SEZ:4-448-0718-000.4
			Editor	K.Freitag					
			Verif.	18.Jun.2015					SEZ07184
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by		Sh 3 / 10 Sh



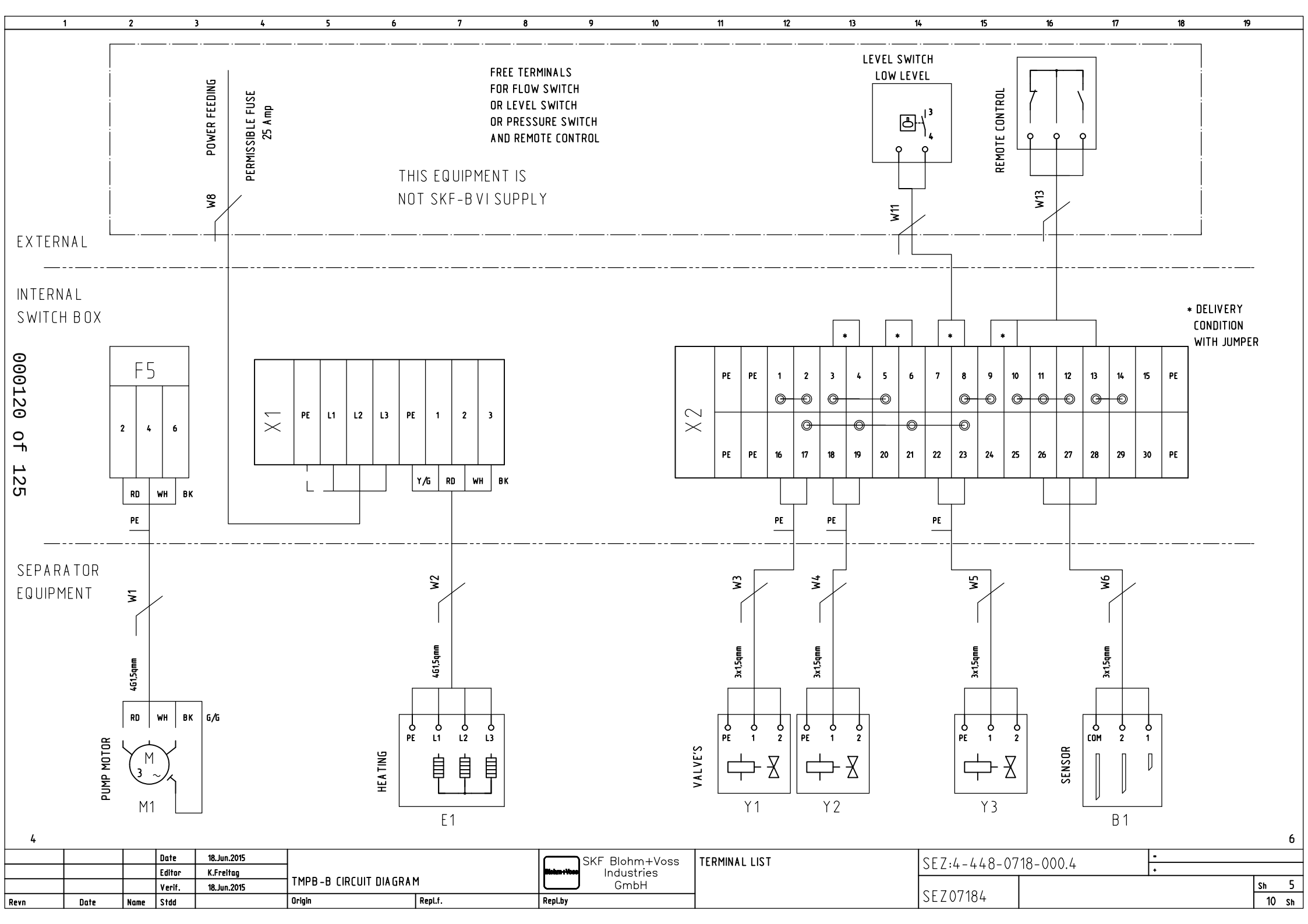
000119 of 125

CONTROL CIRCUIT WITH OMD-24

3

5

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	CONTROL CIRCUIT WITH OMD-24	SEZ:4-448-0718-000.4
			Editor	K.Freitag					
			Verif.	22.Jun.2015					SEZ07184
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by		Sh 4 / 10 Sh



4 6

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM	SKF Blohm+Voss Industries GmbH	TERMINAL LIST	SEZ:4-448-0718-000.4
			Editor	K.Freitag				
			Verif.	18.Jun.2015				SEZ07184
Revn	Date	Name	Stdd		Origin / Repl.f.	Repl.by		Sh 5 / 10 Sh

ECR

1/2 PUMP RUN
NO

3/4 PUMP ABNORMAL
NC

5/6 PPM ALARM
NC

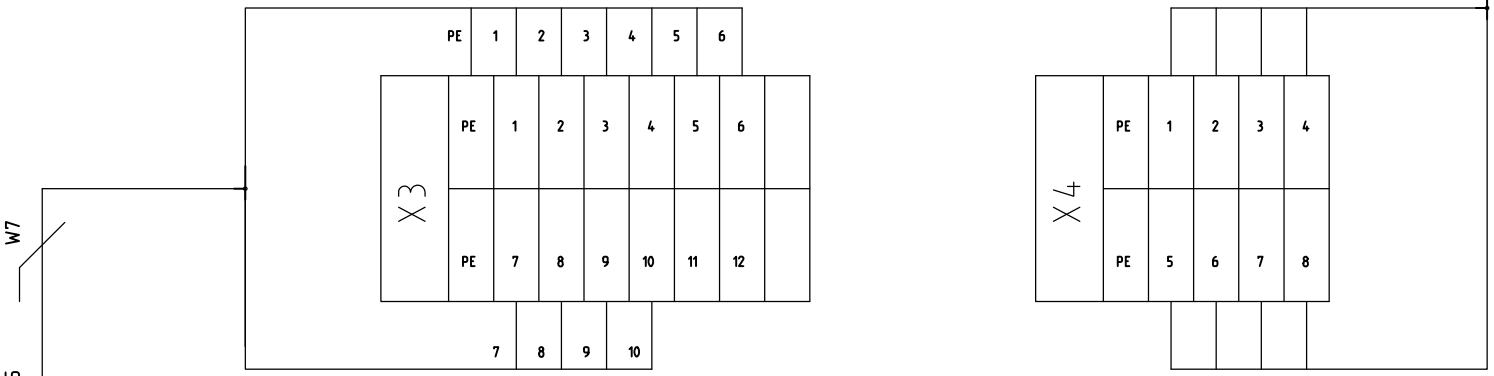
7/8 SPARE

W9

4x2x0,5

EXTERNAL

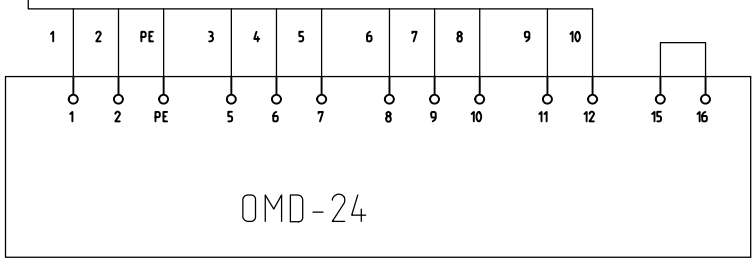
INTERNAL
SWITCH BOX



W7

YSLY 12x0,75

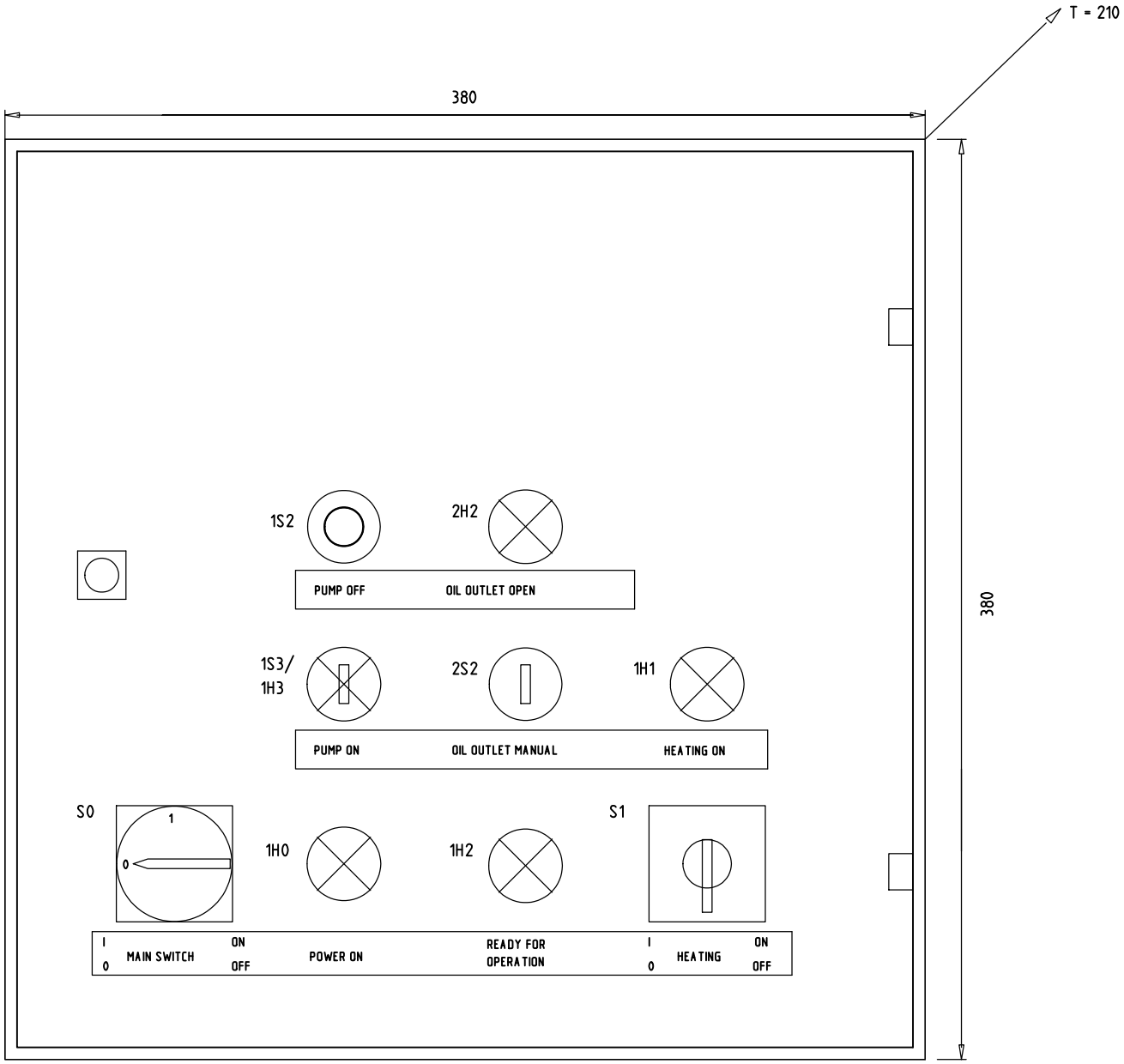
SEPARATOR
EQUIPMENT



TERMINAL LIST WITH OMD-24

			Date	09.Mai.2015	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	TERMINAL LIST WITH OMD-24	SEZ:4-448-0718-000.4
			Editor	K.Freitag					
			Verif.	18.Jun.2015					SEZ07184
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by		Sh 6 / 10 Sh

FRONTVIEW



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TOORSTOP DIVICE

COLOR 7,5 BG 7/2
(Blue/green)

TYPE OF PROTECTION:

IP 54

6

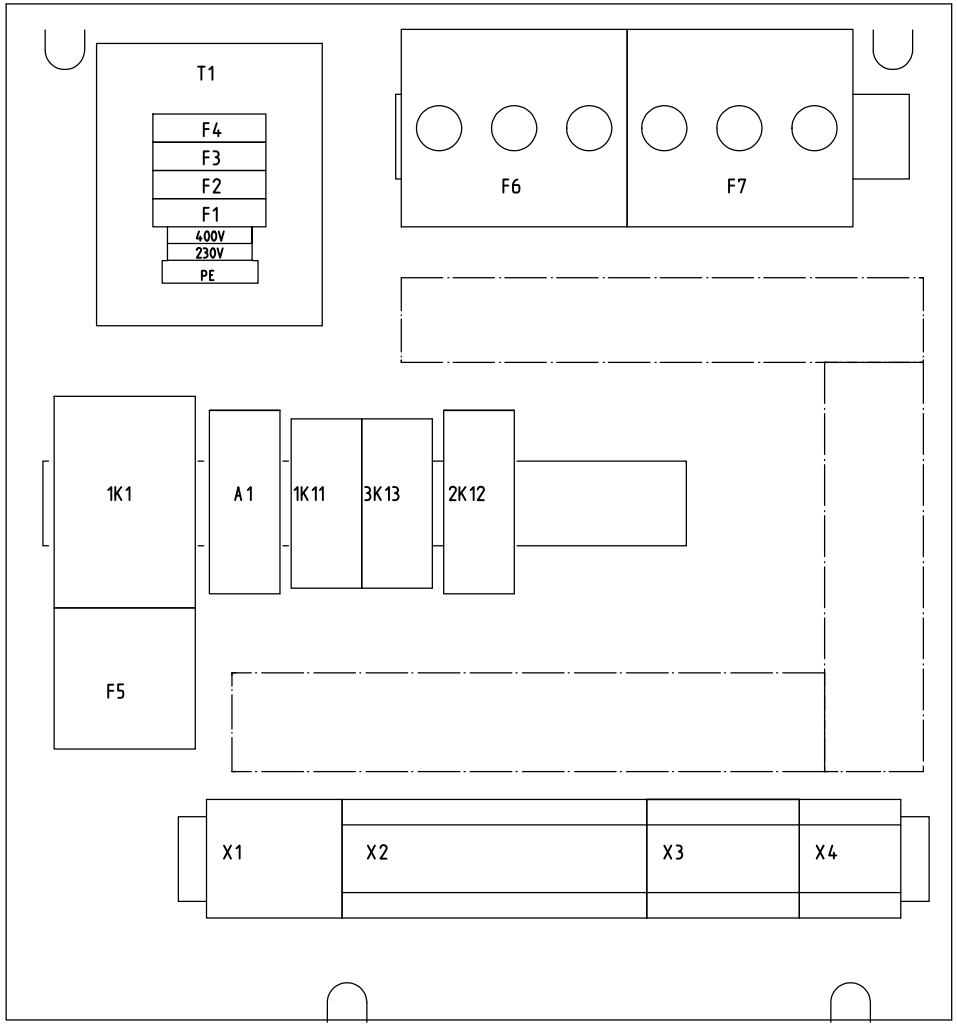
8

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	Anordnung der Geraete LAYOUT OF DEVICES	SEZ:4-448-0718-000.4
			Editor	K.Freitag					
			Verif.	18.Jun.2015					SEZ07184
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by		Sh 7 10 Sh

T1

F1 / F2 PRIM: BK-RD 460V
BK-BR 400V
BK-WH 230V

F3 / F4 SEC: YE-YE 24V



F1 / F2 2 Amp PAT. NO.104632
F3 / F4 4 Amp PAT. NO.109493
F6 / F7 16 Amp PAT. NO.109445

TS35*15
200mm

TS35*7,5
230mm

F5
5,5 - 8,0 Amp

TS35*15
270mm

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LAYOUT OF DEVICES

(X1 ONTO CARRIER OF MOUNTING CHANNEL)
(F6+F7 ONTO SPACER, 60MM)

7 9

			Date	18.Jun.2015	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	Anordnung der Geraete LAYOUT OF DEVICES	SEZ:4-448-0718-000.4
			Editor	K.Freitag					
			Verif.	18.Jun.2015					SEZ07184
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by		Sh 8 / 10 Sh

KABEL NO.	TYP	FROM - TO		
W2	4x1,5qmm	X1 - E1	E1 HEATING	INSTALLED BY B+V IND.
W4	3x1 qmm	X2 - Y2	Y2 OIL DISCHARGE AND CONNECTION VALVE	
W5	3x1 qmm	X2 - Y3	Y3 SEA / BILGE VALVE	
W6	3x0,5qmm	X2 - B1	B1 SENSOR	
W7	12x0,75qmm	X3 - OIL MONITOR	OIL-MONITOR	

W1	3 x1,5mm	F5 - M1	PUMP MOTOR	THESE CABLE WILL NOT BE INSTALLED BY B+V IND.
W3	3x1 qmm	X2 - Y1	DRY RUNNING PROTECTION VALVE	
W8	3 or 4x4,0qmm	X1 - POWER FEEDING		
W9	4x2x0,5qmm	X4 - ECR ALARM PANEL		
W11	2x1,5qmm	X2 - LEVEL SWITCH,PUMP STOP		THIS CABLE AND EQUIPMENT IS NOT SKF-BVI SUPPLY

W13	3x1,5qmm	X2 - REMOTE CONTROL	IN OPTION NOT B+V IND.SUPPLY

8 10

Revn	Date	Name	Stdd				
			Date	22.Jun.2015	TMPB-B CIRCUIT DIAGRAM	SKF Blohm+Voss Industries GmbH	CABEL LIST
			Editor	Freitag	Origin / Repl.f.	Repl.by	SEZ:4-448-0718-000.4
			Verif.	22.Jun.2015			SEZ07184

Sh 9
10 Sh

SEPARATOR TYPE TMPB-B

				Motor MOTOR							Heizung HEATING						
						F6						F7					
Entwicklergröße SEPARATOR SIZE	U (V)	Motorleistung MOTOR POWER P (kW)	I_N (A)	F5 (A)	F5 Materialn. PARTNUMBER	Sicherungseinsatz FUSE-LINK (A)	Sicherungseinsatz FUSE-LINK Stk PCS	Sicherungseinsatz FUSE-LINK Materialn. PARTNUMBER	Halsenpaßeinsatz ADAPTOR SLEEVE Stk PCS	Halsenpaßeinsatz ADAPTOR SLEEVE Materialn. PARTNUMBER	Heizungsleistung HEATING POWER P (kW)	Sicherungseinsatz FUSE-LINK (A)	Sicherungseinsatz FUSE-LINK Stk PCS	Sicherungseinsatz FUSE-LINK Materialn. PARTNUMBER	Halsenpaßeinsatz ADAPTOR SLEEVE Stk PCS	Halsenpaßeinsatz ADAPTOR SLEEVE Materialn. PARTNUMBER	Sicherung Einspeisung FUSE FEEDING (A)
TMPB 10	400V	3,00		5,5-8,0	117326	16	3	109445	3	105090	6,0	16	3	109445	3	105090	25
	460V	3,45															

9

			Date	21.Jul.2010	TMPB-B CIRCUIT DIAGRAM		SKF Blohm+Voss Industries GmbH	SELECTION TABLE TMPB-B	SEZ:4-448-0718-000.4	-
			Editor	K.Freitag						+
			Verif.	18.Jun.2015					SEZ07184	Sh 10
Revn	Date	Name	Stdd		Origin	Repl.f.	Repl.by			10 Sh