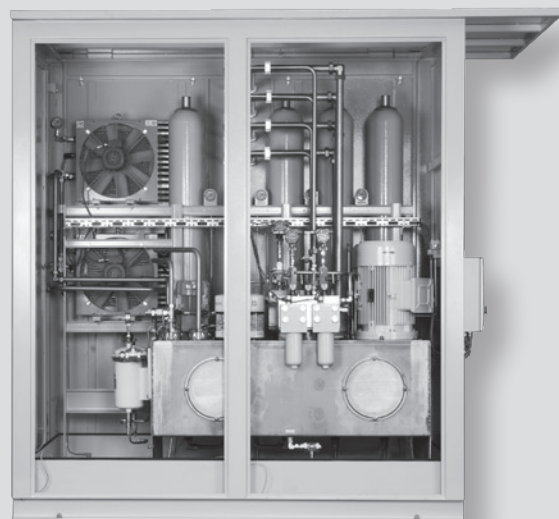




WELCOME...



- *oil-hydraulic systems*
- *measurement technique/control engineering*
- *pneumatic control systems*
- *construction of electronic control cabinets*



asfa actuators

asfa - actuators for the general engineering



Ferdinand Appelberg GmbH



company owner

Dipl. Ing. Ferdinand Appelberg (certified engineer)

general manager

Dipl. Ing. Hartmut Cordruwisch (certified engineer)

Address: Hohensteinstr. 52
D - 44866 Bochum

Phone: (0 23 27) 9 92 - 2 00

Fax: (0 23 27) 3 14 43

E-mail: info@asfa-antriebe.de

Internet: <http://www.asfa-antriebe.de>
<http://www.asfa-actuator.com>

Bank accounts: Nationalbank AG, Essen
(BLZ 36020030) 118338
Volksbank Sprockhövel eG,
(BLZ 45261547) 200222901

Type of company: GmbH

Founded: 1987 in Bochum

VAT reg. no.: Amtsgericht Bochum HBR 3279

USt-Ident. no.: DE 127059840

DELIVERY PROGRAMME

>> hydraulic units

design, project work and delivery of hydraulic units
executed according to your specifications for all fields of
application including installation, starting and maintenance

>> oil lubrication units

design, project work and delivery of oil lubrication units
executed according to your specifications for all fields of
application including installation, starting and maintenance

>> hydro-cylinders / pneumatic-cylinders

differential- or synchronous-cylinder, single or double
acting, with or without adjustment spring, alternatively
with position transmitter and limit switches

>> electro control units / electro control cabinets

design, fabrication, installation and starting of electric
systems and actuators as well as measuring and regulation
systems (e.g. Jumo, Mesa, Siemens, Gestra)
programming of SPC-control systems (e.g. Siemens S 7,
Procontik, Klöckner-Moeller, HIMA, Mitsubishi)

>> on-site installation

inspection and servicing of hydraulic units of various types

Some examples by executed hydro-drive assemblies:

>> HYDRO-DRIVE ASSEMBLIES

TYPE HA 100

Application:

Hydraulic actuation of valves in power plants

Arrangement of design regarding intermittent operation as a factor of safety



>> HYDRO-DRIVE ASSEMBLY

TYPE HA 250

Control system according to SR-safety regulations (TRD 421; AD-Merkblatt 2) with hydroaccumulator for emergency service and intermittent operation

Design as two-fold servo control with abundant motor and pump units



Some examples by executed hydro-drive assemblies:

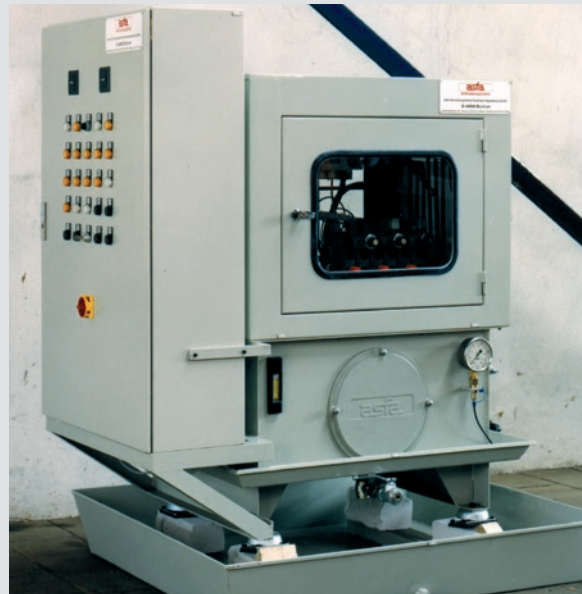
>> HYDRO-DRIVE ASSEMBLY

TYPE HA 160-3,0-3,0-190/1,1-1,1-400V

Application:

Hydraulic actuation of one reducing valve with a nozzle-injection-control-valve and a check valve
Execution with quick-opening (hydraulically)

Arrangement of design regarding intermittent operation and step-by-step-adjustment



>> HYDRO-DRIVE ASSEMBLY

TYPE HA 160-4,5-4,5-190/1,5-,1,5-400V

Application:

Hydraulic actuation of one control valve.
Execution with quick-closing (with the help of a spring) according to SR-safety regulations (TRD 421; AD-Merkblatt 2)

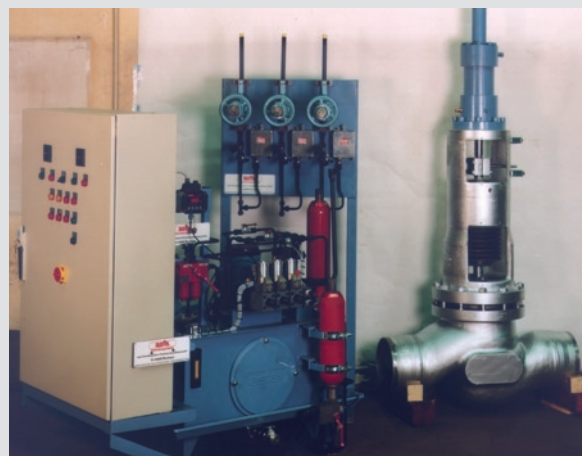
Arrangement of design regarding intermittent operation and step-by-step-adjustment

Execution of the cylinders:

- single acting
- with ultrasonic position measuring system

Execution of the steam testing unit:

- with lockable check valves
- without electric test arrangement
- with mechanical pressure switches



Some examples by executed hydro-drive assemblies:

>> HYDRO-DRIVE ASSEMBLIES

TYPE HA 400-21,0-21,0-195/7,5-7,5-400V and HA 400-28,5-28,5-195/11,0-11,0-400V



Application:

Hydraulic actuation of respectively two reducing valves per hydro-drive assembly with respectively one injection-control-valve. Execution with quick-closing (with the help of a spring) according to SR-safety regulations (TRD 421; AD-Merkblatt 2) and additional quick-opening (hydraulically)

Arrangement of design regarding intermittent operation and continuous adjustment

>> pertinent STEAM TESTING UNITS

Execution:

- with lockable check valves
- with electric test arrangement
- with mechanical pressure switches
- all components are installed in a cabinet



Some examples by executed hydro-drive assemblies:

>> HYDRO-DRIVE ASSEMBLIES

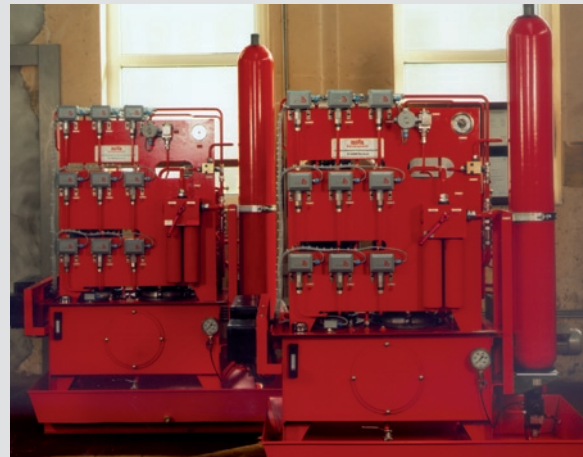
TYPE HA 160-6,0-6,0-190/2,2-2,2-400V/Ex

Application:

Hydraulic actuation of respectively two control valves (medium: gas) per hydro-drive assembly. Execution with quick-opening (with the help of a spring) in 0.1 sec.

Arrangement of design regarding intermittent operation and continuous adjustment (stroke time about 0.3 sec.)

Execution of the complete hydro-drive assembly in explosion-protection



>> HYDRO-DRIVE ASSEMBLY

TYPE HA 400-3,0-3,0-190/1,1-1,1-400V

Application:

Hydraulic actuation of respectively two reducing valves per hydro-drive assembly with respectively one injection-control-valve
Execution with quick-closing (with the help of a spring) according to SR-safety regulations (TRD 421; AD-Merkblatt 2) and additional quick-opening (hydraulically)

Arrangement of design regarding intermittent operation and step-by-step-adjustment

STEAM TESTING UNITS

Execution:

- with lockable check valves
- without electric test arrangement
- with mechanical pressure switches



Some examples by executed hydro-drive assemblies:

>> HYDRO-DRIVE ASSEMBLIES

TYPE HA 63-1,5-190/0,55-400V und HA 63-3,0-190/1,1-400V

Application:

Hydraulic actuation of respectively one control valves per hydro-drive assembly
Arrangement of design regarding intermittent operation and continuous adjustment with quick-opening (hydraulically)



>> HYDRO-DRIVE ASSEMBLY

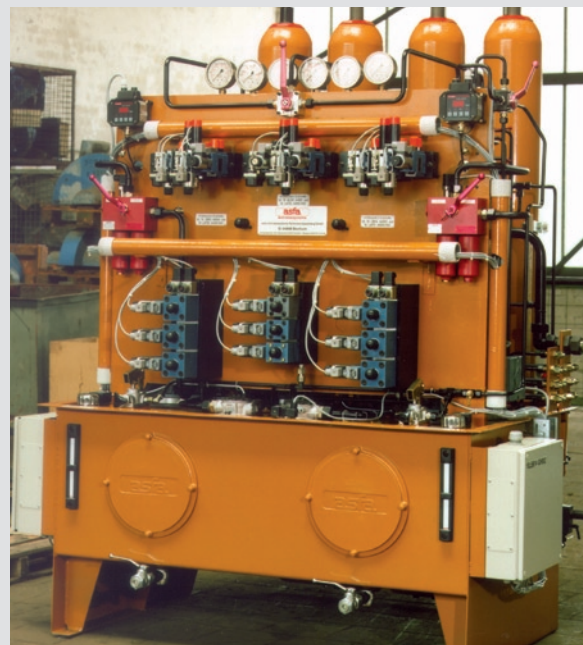
TYPE HA 630-16,5-16,5-16,5-200/7,5-7,5-7,5-7,5-400V

Application:

Hydraulic actuation of respectively three reducing valves per hydro-drive assembly with respectively one injection-control-valve and one check valve. Execution with quick-closing (with the help of a spring) according to SR-safety regulations (TRD 421; AD-Merkblatt 2) and additional quick-opening (hydraulically)

Arrangement of design regarding intermittent operation and continuous adjustment

Execution of the oil tank with a deviding wall (double-tank) with respectively two motor-pump units and a high pressure double filter per tank-half.



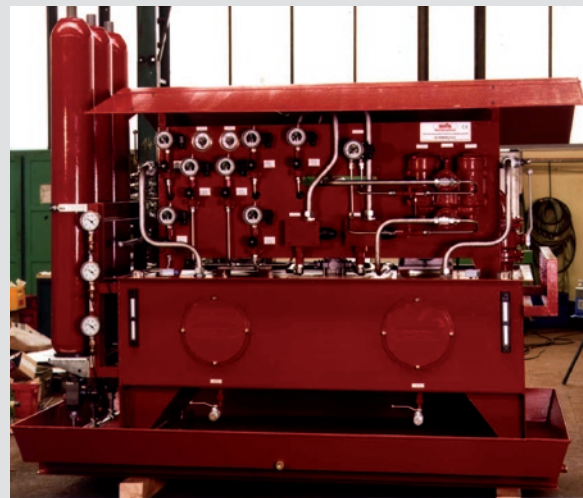
Some examples by executed hydro-drive assemblies:

>> HYDRO-DRIVE ASSEMBLY

TYPE HA 1000-94,5-94,5-45/7,5-7,5-400V/Ex

Application:

Hydraulic actuation of respectively two bypass valves and two pressure reducing valves. Execution of the complete hydro-drive assembly in explosion proof and with an oil tank with a dividing wall (double-tank)



>> HYDRO-DRIVE ASSEMBLY

TYPE HA 400-27,0-27,0-120/7,5-7,5-400V/Ex

Application:

Hydraulic actuation of one reducing valve with a nozzle injection valve and a check valve

Arrangement of design regarding continuous adjustment and continuous operation (with the help of axial piston pumps)

Execution with quick-closing and quick-opening (both hydraulically)

Execution of the complete hydro-drive assembly in explosion protection and in stainless steel (oil tank, oil pan, shed and hydraulic pipework)



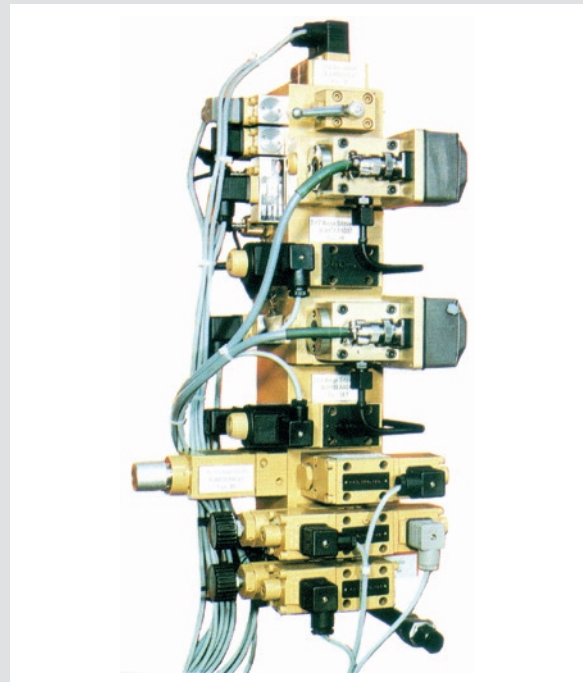
OPERATIONAL CONTROL BLOCK

>> OPERATIONAL CONTROL BLOCK

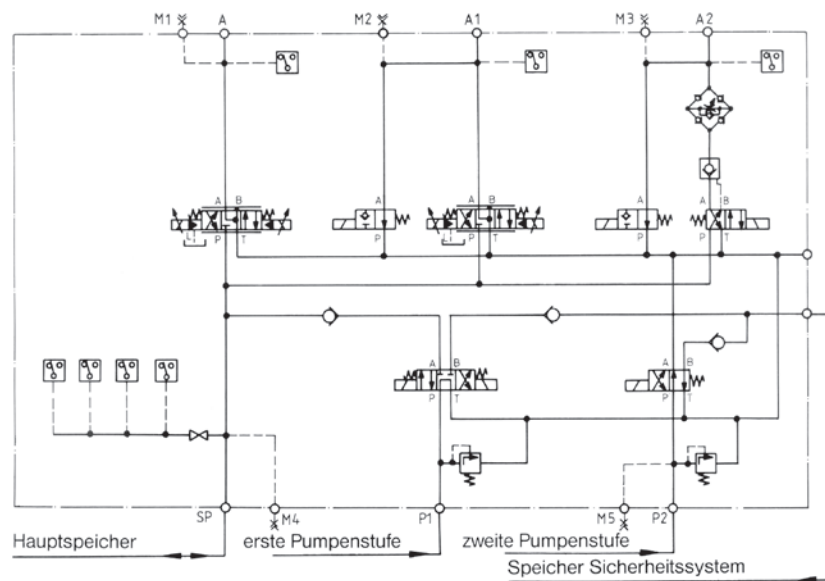
For the hydraulic actuation of control valves in power plants.

Arrangement of design as two-fold servo control for intermittent operation as well as for separate hydraulic supply of main and safety phase winding.

Abundant motor double pump units.



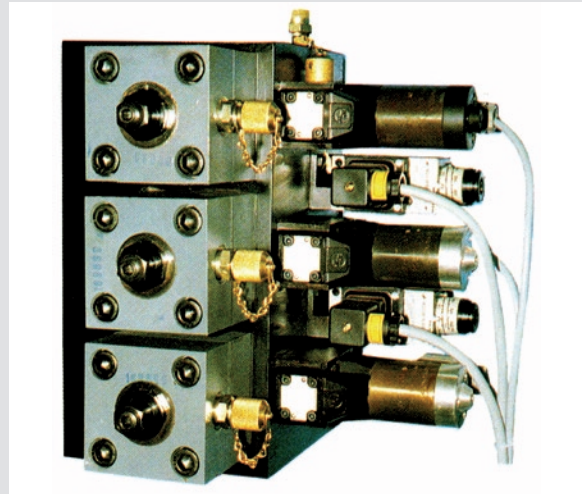
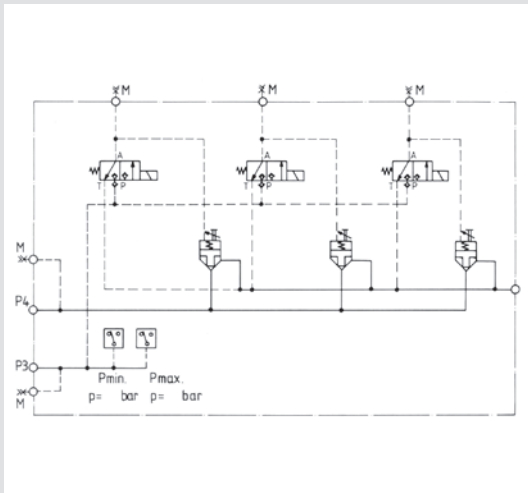
Funktionsschema



Control of safety valves according to SR-Safety regulations (TRD 421 or AD-Merkblatt A2)

>> SAFETY BLOCK

NG 16 to NG 40



Cartridge valves alternatively with lift stop or with switch position surveillance

>> STEAM TESTING UNIT

Execution:

- with lockable check valves
- with or without electric test arrangement
- alternatively with electric or mechanical pressure switches
- alternatively with separate frame-stand for floor installation or with frame for wall-installation

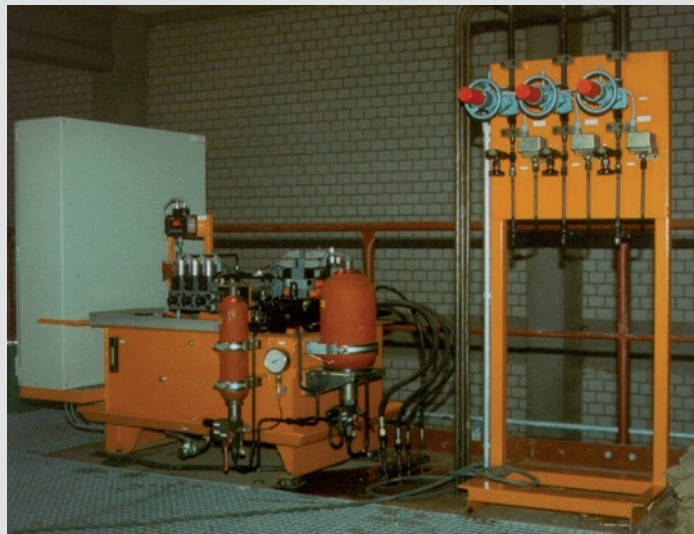
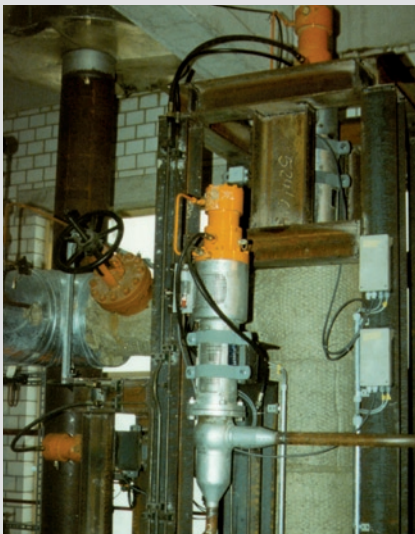
Example:

Steam testing unit with mechanical pressure switches, without electric test arrangement and with separate frame-stand for floor installation



Example of a hydraulic unit, installed in a power plant:

>> **HYDRO-DRIVE ASSEMBLY with STEAM TESTING UNIT
and HYDRAULIC CYLINDERS in the power plant Wiesengrund in Eisenach
TYPE HA 250-3,0-3,0-190/1,1-1,1-400V**



Application:

Hydraulic actuation of one reducing valve with a nozzle-injection-control-valve and a check valve

Execution with quick-closing (with the help of a spring) according to SR-safety regulations (TRD 421; AD-Merkblatt 2)
and additional quick-opening (hydraulically)

Arrangement of design regarding intermittent operation and step-by-step-adjustment

Execution of the cylinders: single acting with damping in full home position

Example of a hydraulic unit, installed in power plant:

>> **HYDRO-DRIVE ASSEMBLY with HYDRAULIC CYLINDERS** in the power plant Dieselstraße in Halle
TYPE HA 160-4,5-4,5-190/1,5-1,5-400V

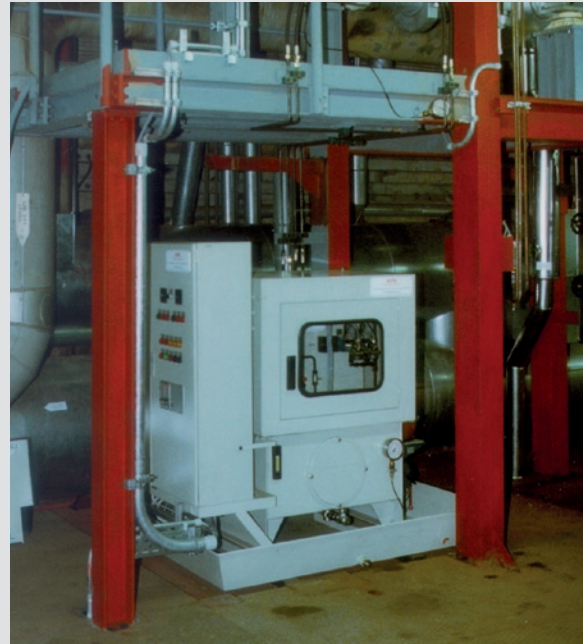
Application:

Hydraulic actuation of two reducing valves with respectively one injection-control-valve Execution with quick-closing (with the help of a spring)

Arrangement of design regarding intermittent operation and continuous adjustment

Execution of the cylinders:

- single acting with damping in full home position
- with ultrasonic position measuring system



Example of a hydraulic cylinder, installed in power plant:

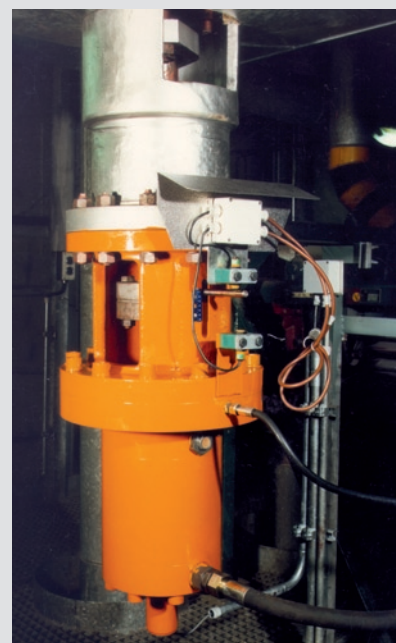
>> **HYDRAULIC CYLINDER** in the power plant Bergkamen
TYPE CEK 250 C 200/90 x 70 DHUW

Application:

Hydraulic actuation of one HP-reducing valve Execution with quick-opening (with the help of a spring)

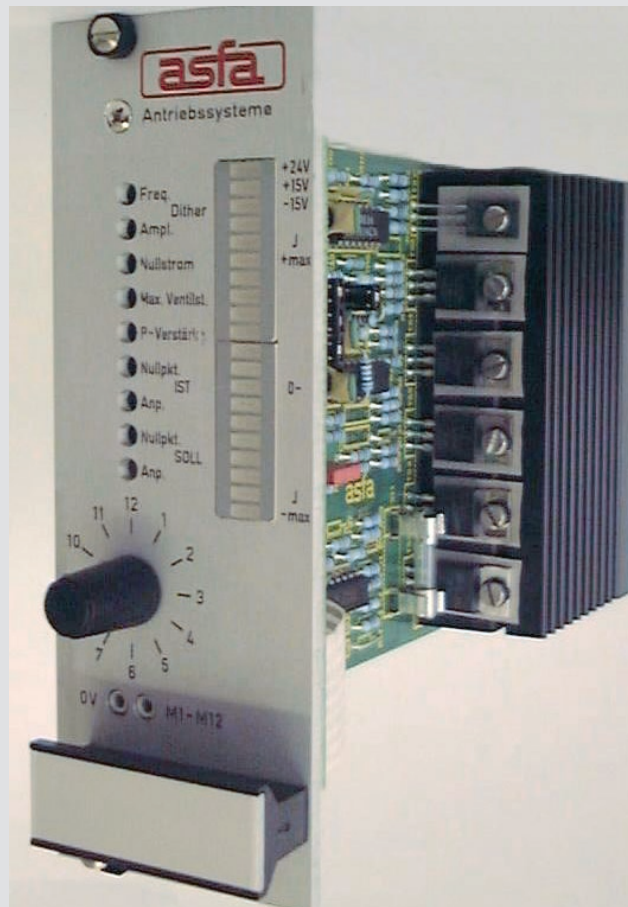
Execution of the cylinders:

- single acting with damping in full home position
- with ultrasonic position measuring system
- with two pieces inductive limit switches



Controller card Type ES228.3 (E300.3)

The card is an own evolution of the **asfa-Antriebssysteme** which characterizes for applications in power and chemical plants in which the position actual value of the corresponding valve is supposed to be transmitted as an analogous signal to the DCS outstandingly.



HYDRO CYLINDERS

Are distinguished by their long operating life.
This is guaranteed by using high-quality material
for pilot and sealing elements.

Type of cylinders:

- Single acting
- Double acting
- Synchronous operating cylinder
with or without adjustment spring

Special designs belong to our delivery program as
well as the fabrication according to metallurgical
works` standards.

According to the stand of technology, our measuring
systems are non-contacting.

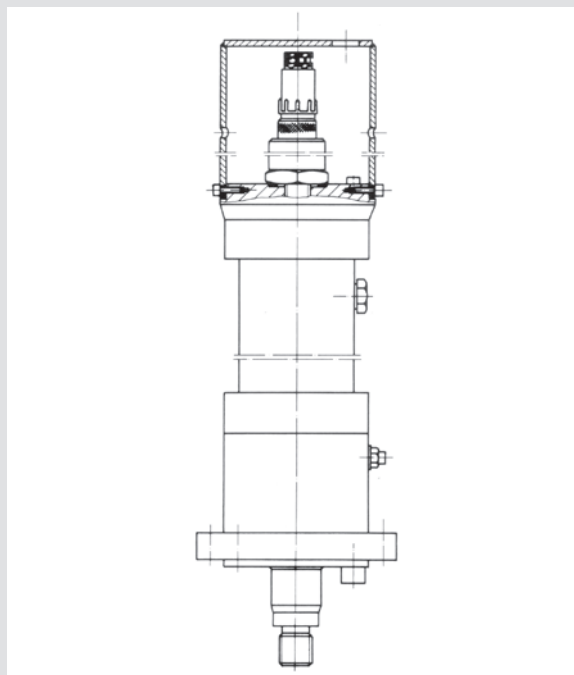


>> Hydro-Zylinder

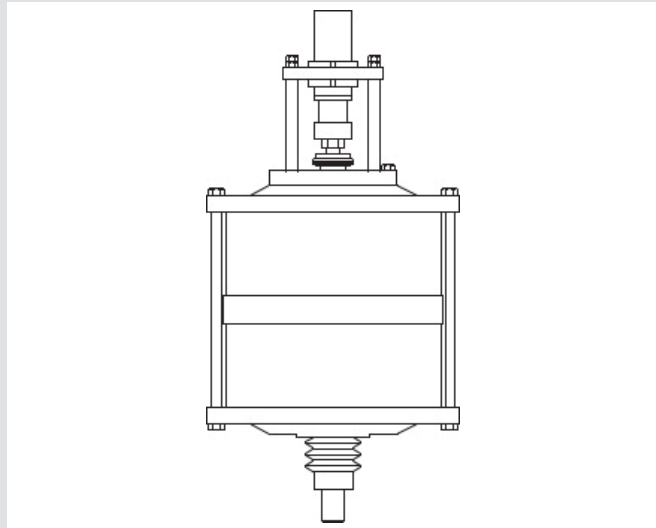
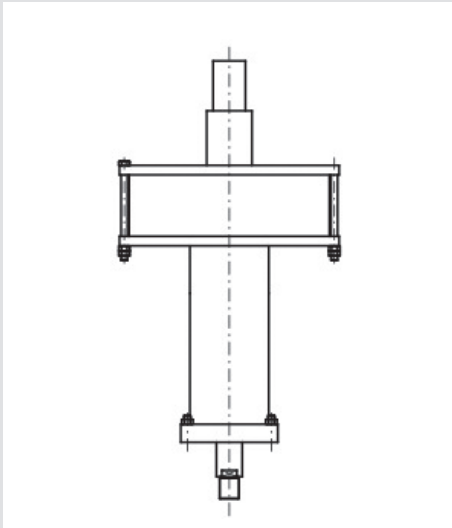
Typ CD 250 C

Nominal pressure: 250 bar

Double acting with damping in full home position



PNEUMATIC CYLINDERS



Are distinguished by their long operating life. This is guaranteed by using high-quality material for pilot and sealing elements.

Type of cylinders:

- Single acting
- Double acting
- Synchronous operating cylinder with or without adjustment spring

Special designs belong to our delivery program as well as the fabrication according to metallurgical works` standards.

According to the stand of technology, our measuring systems are non-contacting.

Some examples by executed pneumatic cylinders:

>> PNEUMATIC CYLINDER

TYPE PZ16C-600/80 x 205

Application:

Pneumatic actuation of respectively one valve (medium: gas)
Execution with control and quick-closing (with the help of a spring)

Execution of the cylinders:

- single acting
- with readjusting spring (direction: CLOSE)

Execution of the pneumatic control system:

- with air supply station
- with electro-pneumatic positioner (signal transmission: 4 - 20 mA)
- with 3/2-way-solenoid-valve for quick-closing



>> PNEUMATIC CYLINDERS

TYPE PZ16C-2x500/56 x 55 D (above) and

TYPE PZ16C-2x500/56 x 55 E (below)

Application:

Pneumatic actuation of one reducing valve Execution with control and quick-opening (with the help of a spring cylinder between the two pneumatic cylinders)

Execution of the upper cylinder:

- double-cylinder
- double acting
- with safety damper

Execution of the lower cylinder:

- double-cylinder
- single acting

Execution of the pneumatic control system:

- with pneumatic positioner (signal transmission: 0.2 - 1.0 bar)
- with 3/2-way-solenoid-valve for quick-opening



Examples by executed pneumatic cylinders in a plant of the EFC (Egyptian Fertilizers Co.) in Suez (Egypt)

>> TYPE PZ16C-600/80 x 120 - SO

Application:

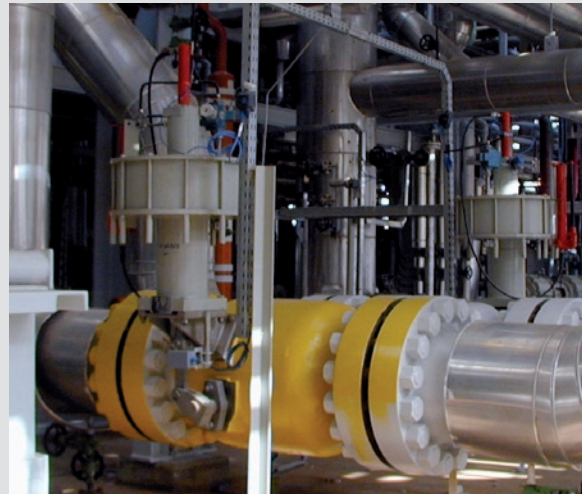
Pneumatic actuation of respectively one shut-off valve
(medium: gas). Execution with quick-closing (with the help
of springs inside the cylinder)

Execution of the Cylinders:

- differential cylinder
- single acting
- with mounted hand pump for emergency

Execution of the pneumatic control system:

- with 3/2-way-solenoid-valve for quick-closing



>> PNEUMATIC CYLINDERS

TYPE PZ16C-2x500/56 x 55 D (front) and TYPE PZ16C-2x500/56 x 55 E (back)

Application:

Pneumatic actuation of one reducing valve.
Execution with control and quick-opening (with the help
of a spring cylinder between the two pneumatic cylinders)

Execution of the cylinder in the front:

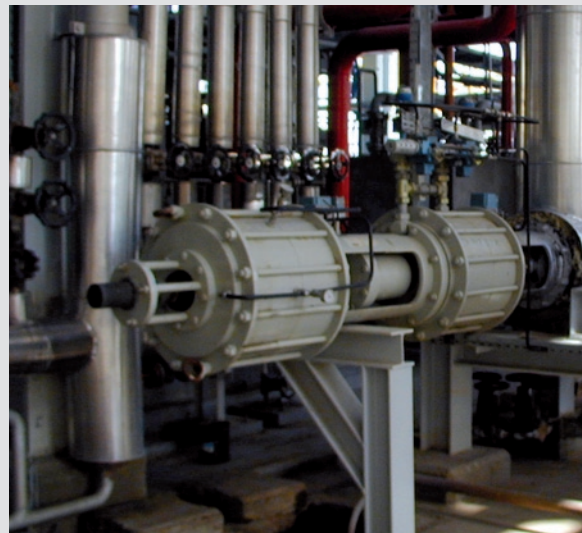
- double-cylinder
- double acting
- with safety damper

Execution of the cylinder in the back:

- double-cylinder
- single acting

Execution of the pneumatic control system:

- with pneumatic positioner (signal trans-mission: 0.2 - 1.0 bar)
- with 3/2-way-solenoid-valve for quick-opening

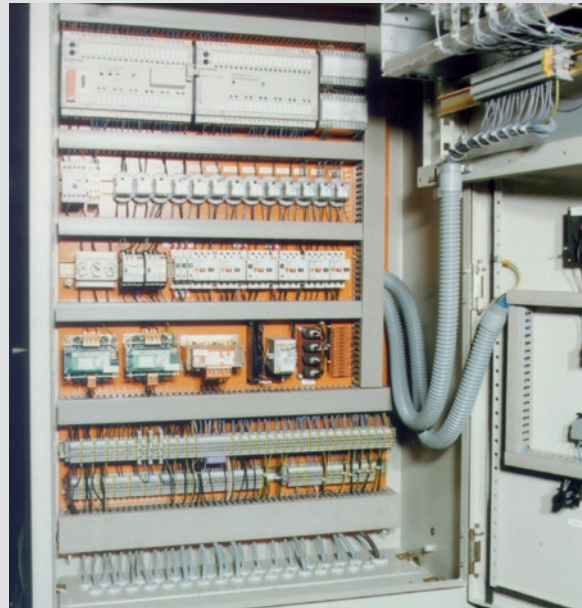


ELECTRO CONTROL CABINET

for the control of a hydraulic unit for control valves with the help of a Simatic S5-control system



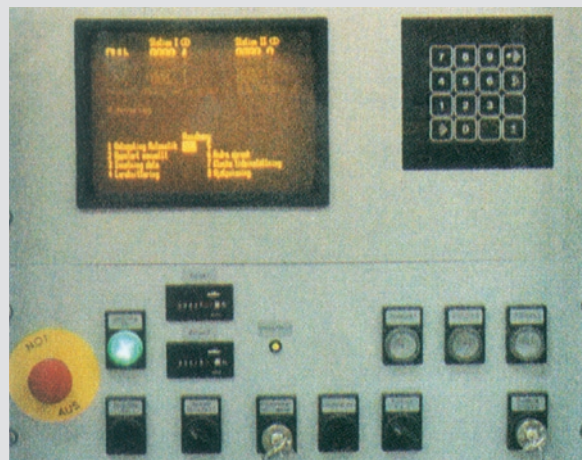
Electro control cabinet (outside sight)



Electro control cabinet (inside sight)

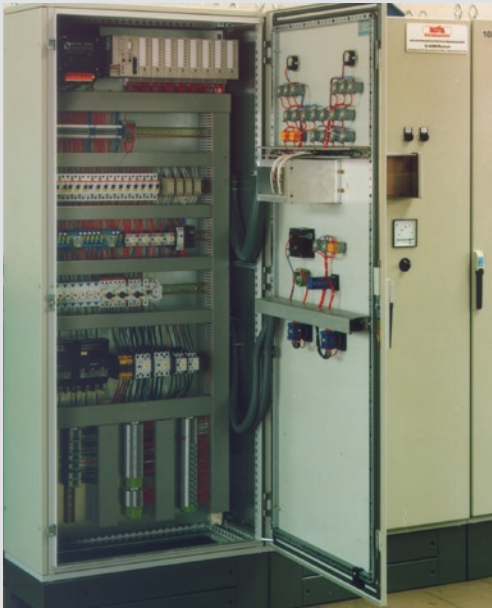
ELECTRIC-ELECTRONIC CENTRAL CONTROL UNIT

- For the control and regulation of two turbine by-pass stations in split-range operation. Pressure and temperature control with micropro-grammed control in 6 HE electronic chassis.
- Arrangement with 9" monitor and 16-foil keyboard used for the programming of single control parameters. The index and actual values are shown on-line on the monitor Manual and automatic operation

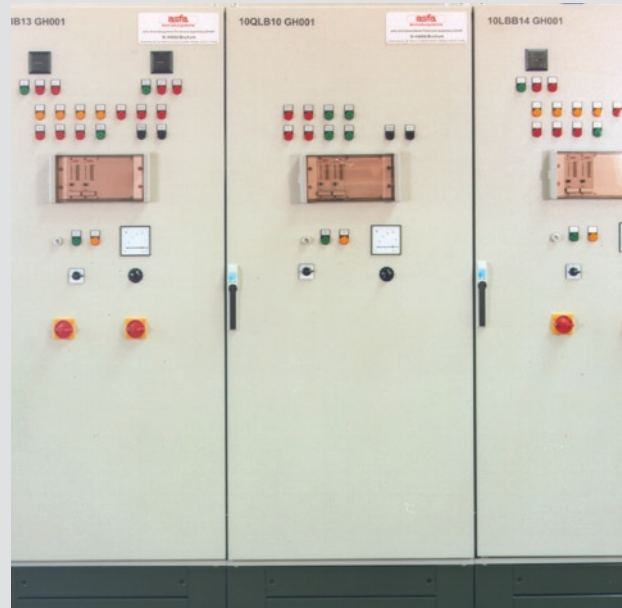


ELECTRO CONTROL CABINET

for the control of a hydraulic unit for three reducing valves with the help of a Simatic S5-control system



Electro control cabinet (inside sight)



Electro control cabinet (outside sight)

OPERATIONAL TEST

Before leaving our works, all our components (e.g. hydraulic drive units, hydraulic- and pneumatic cylinders, steam testing units etc.) are subjected to an operational test (e.g. adjustment of floating times) that is effected with the help of our self-designed test stand.



>> Example:

Installation prepared for the operational test of a hydraulic drive unit with two steam testing units as well as the hydraulic cylinders mounted on the valves

>> TYPE: HA 400-8,25-8,25-190/3,0-3,0-400V

Application:

Hydraulic operation of reducing valves with nozzle-injection valve and check valve. Execution with quick-closing (via spring) according to safety regulations (TRD 421; AD-Merkblatt 2).

Designed for step-by-step-adjustment and intermittent operation

Cylinder design: single acting with stop position damping





CERTIFICATE

The TÜV CERT Certification Body
of TÜV Rheinland Industrie Service GmbH

certifies in accordance with
TÜV CERT procedures that



BOMAF

BOMAF Armaturen GmbH
Hohensteinstraße 52
D - 44866 Bochum



asfa
antriebssysteme
asfa-Antriebssysteme
Ferdinand-Appelberg GmbH
Hohensteinstraße 52
D - 44866 Bochum

has established and applies a quality management system for

Design, production and sale of actuators
Design, production and sale of special valves and fittings
low-, medium- and high-pressure for steam, water and gas to be used
in power stations, energy industry and nuclear engineering

An audit was performed, Report No. 76035.

Proof has been furnished that the requirements according to

DIN EN ISO 9001:2000

are fulfilled.

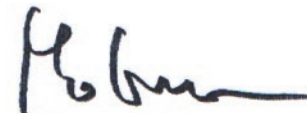
The certificate is valid until **2009-11-30**.

Certificate Registration No. **09 100 76035**



Cologne, 2007-01-12

First certification 1997



TÜV CERT Certification Body of
TÜV Rheinland Industrie Service
GmbH

www.tuv.com



CERTIFICATE

Quality-Assurance System

acc. to European Directive 97/23/EC

Certificate No.: 01 202 611/Q-00 0002

Name and address of manufacturer:



BOMAF

BOMAF Armaturen GmbH
Hohensteinstraße 52
D - 44866 Bochum



asfa-Antriebssysteme
Ferdinand-Appelberg GmbH
Hohensteinstraße 52
D - 44866 Bochum

The TÜV CERT Certification Body for Pressure Equipment hereby certifies that the above -mentioned manufacturer operates a quality system according to the European Directive 97/23/EC. The manufacturer has the permission to affix the following CE marking to pressure equipment described and manufactured in accordance to the scope covered by this Quality-Assurance System:

CE 0035

Approved acc. to Directive
97/23/EC:

QA-System (Module H1)
The QS-Modules E1, E, D1, D and H of the Directive are performed by Module H1

Audit Report No.:

611/Q-00 0002

Scope:

Design, production and sale of actuators, special valves and fittings low-, medium- and high-pressure for steam, water and gas to be used in power stations and energy industry

Plant:

Hohensteinstr. 52
D - 44866 Bochum

Valid until:

December 2009

Cologne, March 12, 2007

TÜV CERT-Certification Body
for Pressure Equipment

Wichert
Dr. Ing. W. Wichert

Notified Body, ID-No. 0035

TÜV Rheinland Industrie
Service GmbH
Am Grauen Stein
51105 Köln

Tel. ++49-221/806-0
Fax ++49-221/806-1354
e-mail tuevat@de.tuv.com

Member of



CONFÉDÉRATION EUROPÉENNE D'ORGANISMES DE CONTRÔLE

Rev 3



Bescheinigung Certificate

über die Zuerkennung eines Bauteil-
kennzeichens für for the grant of a type-test approval
mark in respect of

Sicherheitsventile

Aufgrund einer Bauteilprüfung - In virtue of a type-test -
Prüfbericht des test report by

RWTÜV vom 30.06.2006

wird dem Antragsteller, der Firma the applicant, the company

**asfa-Antriebssysteme
Ferdinand Appelberg GmbH, 44866 Bochum**

zuerkannt das Bauteilkennzeichen-Nr. is granted the type-test approval mark No.

TÜV . SV . 06 - 862

für for

Elektro-hydraulische Sicherheitsventilsteuerung zur Steuerung von hydraulisch betätigten Hauptventilen

Typ type

EP-H/1HV-3R	Ansteuerung von einem Hauptventil,	3fach-Ruheprinzip
EP-H/1HV-2R	Ansteuerung von einem Hauptventil,	2fach-Ruheprinzip, 1fach-Arbeitsprinzip
EP-H/2HV-3R	Ansteuerung von zwei Hauptventilen,	3fach-Ruheprinzip
EP-H/2HV-2R	Ansteuerung von zwei Hauptventilen,	2fach-Ruheprinzip, 1fach-Arbeitsprinzip

Die Zuerkennung erfolgt in Anwendung der The adjudication is made pursuant to

AD 2000-Merkblatt A2; VdTÜV-Merkblatt „Sicherheitsventil 100“;
Druckgeräte-Richtlinie 97/23/EG; TRD 421

Sie ist bis zum **31.10.2011** It expires on **2011-10-31**
befristet und kann widerrufen werden. and is revocable.

Die Bescheinigung vom 15.10.2001 The certificate dated 2001-10-15
wird hierdurch ersetzt. is replaced herewith.

Hinweis: Der Hersteller oder Importeur ist ver-
pflichtet, den zuständigen Sachverständigen zu
beauftragen, Armaturen aus der laufenden Ferti-
gung auf Übereinstimmung mit dem Baumuster
einmal jährlich stichprobenweise zu überprüfen.

Note: The manufacturer or importer is obliged
to the competent Authorized Inspector to conduct
a random check on the accessories concerning
identity to the type once a year. The accessories
have to be taken from the current production.

Berlin, 17. Juli 2006
Blo/Wei

Verband der
Technischen Überwachungs-Vereine e.V.
Geschäftsbereich Anlagentechnik,
Arbeitswelt, Systemsicherheit
– Zertifizierungen und Registrierungen –



Blohm

ASSEMBLY AND OTHER SERVICES

Executed by trained specialist staff.

- Complete tubing on the spot
- Repairing of hydro-aggregates
- Starting of oil-hydraulic plants
- Modernization of older plants
- Permanent care of aggregates by means of preventive maintenance
- Repairing of hydro-cylinders

asfa-HYDRAULIC-AGGREGATES

Principally, as to all aggregates the hydraulic components are mounted on a perpendicular switch board.

>> Through this we achieve:

- Optimal overall-view,
- operation and
- easy-to-service aggregates.

In order to protect the components and to prevent resp. avoid possibly occuring leaks, the aggregates are equipped with a safety hood that can be opened from both sides.



asfa - Antriebssysteme

Ferdinand Appelberg GmbH

Hohensteinstraße 52
44866 Bochum (Germany)

Phone: + 49 / 23 27 / 99 22 00

Fax-No.: + 49 / 23 27 / 3 14 43

E-mail: info@asfa-antriebe.de

Internet: <http://www.asfa-antriebe.de>
<http://www.asfa-actuator.com>