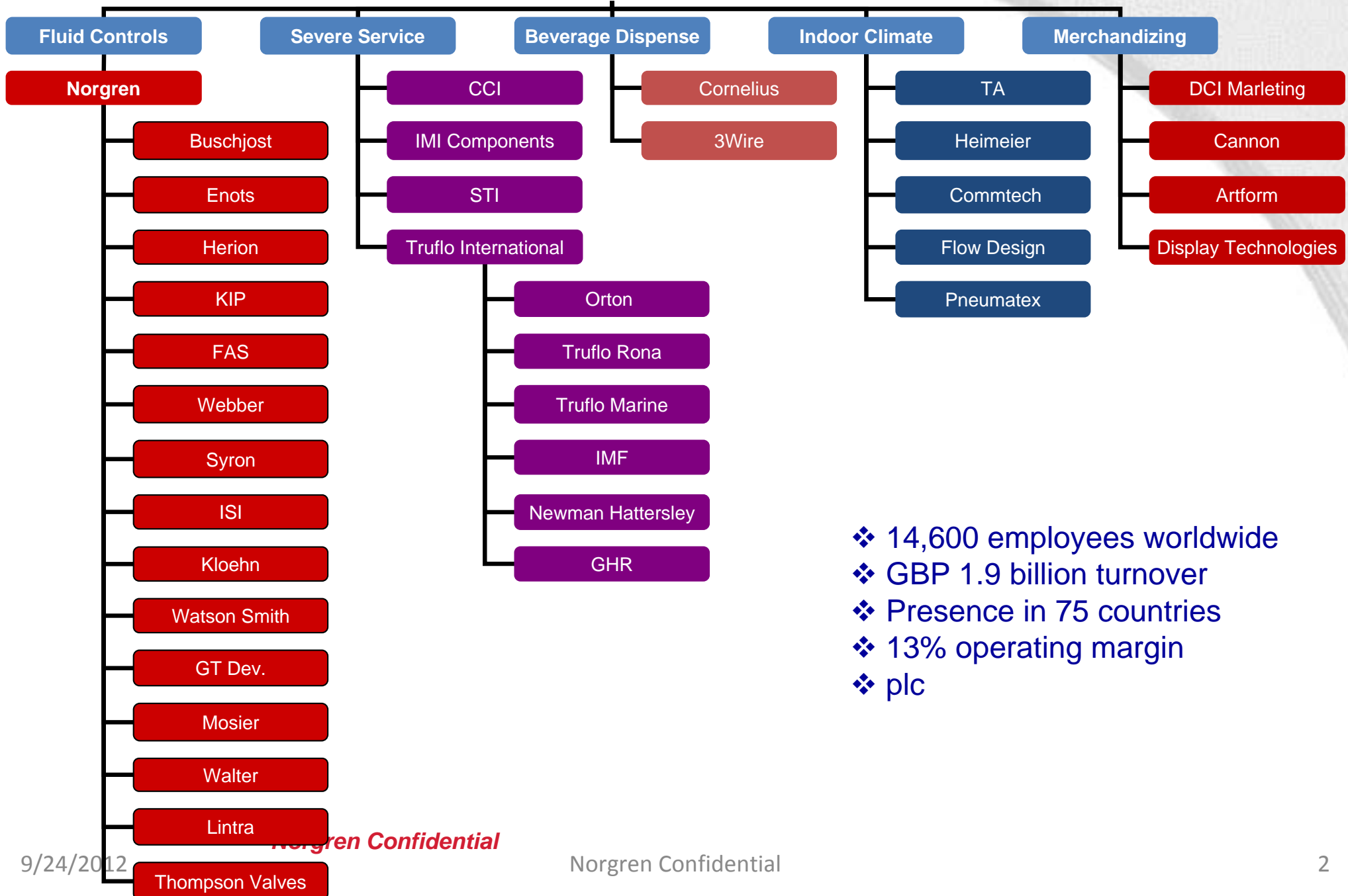


# CREATING ADVANTAGE WITH OUR PEOPLE, PRODUCTS, INNOVATION AND SERVICE

**YOU CAN SEE  
OUR THINKING**

ENGINEERING ADVANTAGE





- ❖ 14,600 employees worldwide
- ❖ GBP 1.9 billion turnover
- ❖ Presence in 75 countries
- ❖ 13% operating margin
- ❖ plc

O

Oil



G

Gas



C



## Applications in the area ...

- **UPSTREAM** - Expolration of Oil & Gas, On- and Offshore
- **MIDSREAM** - Transport of Oil & Gas, via pipelines or mobil transportation
- **DOWNSTREAM** - Further processing of Oil & Gas, in Refineries and Production facilities in the Chemicals and Petrochemicals



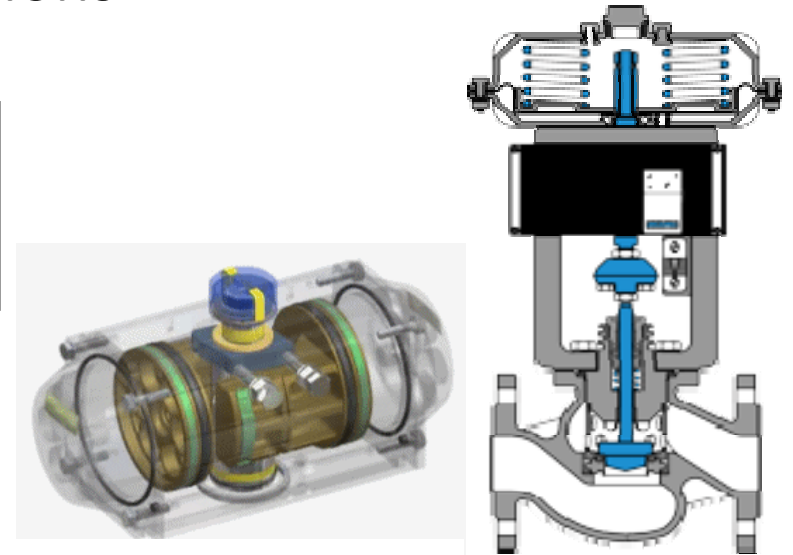
# O&G Applications



# OGC – Performance & Applications

## Solenoid valves to control pneumatic actuators in potentially explosive areas

- To control quarter turn actuator
- To control linear actuators
- For emergency shut down at actuators with positioners



### *Chemical, Petrochemical, Refineries*



### *Refineries, Oil & Gas*





# P

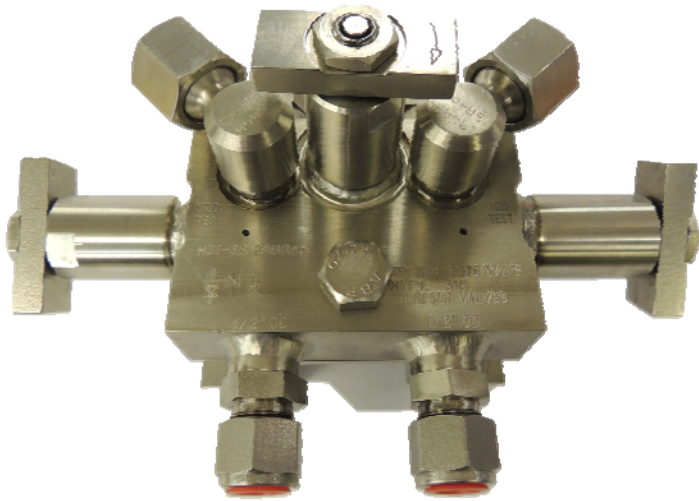
## Power



### Applications in the area ...

- **CONVENTIONAL** - Thermal energy is produced by burning fuels
- **COGENERATION (CHP)** - Production of power and heat together
- **NUCLEAR** - Thermal energy produced by Nuclear fission

## PRODUCT OVERVIEW



- Instrumentation Needle and Globe Valves.
- Bellows Sealed and Gland Packed
- Inline Valves and Multi-valve Manifolds
- Check Valves / Non-return Valves
- Pressure Regulators
- Non-return Valves
- Excess Flow Valves
- Stainless Steel Solenoid Valves
- Filter Pressure Regulators



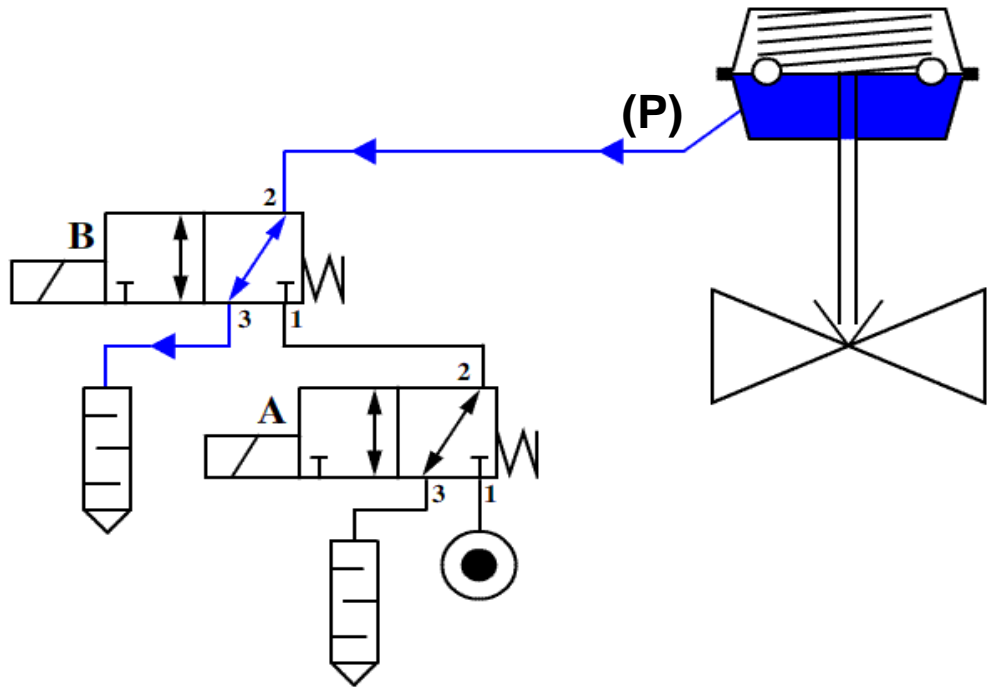
# RVM SYSTEMS – COMMON TERMINOLOGY

- Common terminology referring to the function:
  - 1oo2 (1 out of 2) “safety”
    - Redundancy for process valve closure
    - Increases safety but reduces availability
  - 2oo2 (2 out of 2) “availability”
    - Redundancy to keep the process valve open
    - Increases availability but reduces safety
  - 2oo3 (2 out of 3)
    - Redundancy for both opening and closing the process valve
    - Increases safety and availability



# REDUNDANT SYSTEM 'SAFETY'

Double channel: switching on: SERIES / switching off : PARALLEL



'1' out of (oo) '2'

## "1oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	0	0	0
ONE channel fail its function	1	0	0
	0	1	0

De Energise  
Without  
Error

Error  
Valve  
A

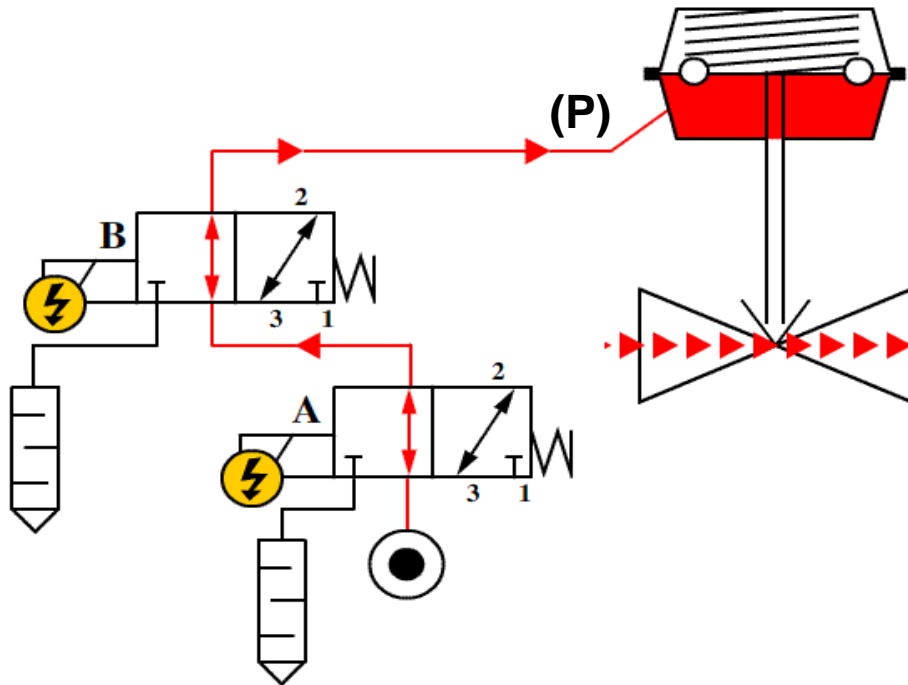
Error  
Valve  
B

## "1oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	1	1	1
ONE channel fail its function	1	0	0
	0	1	0

# REDUNDANT SYSTEM 'SAFETY'

Double channel: switching on: SERIES / switching off : PARALLEL



'1' out of (oo) '2'

## "1oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	0	0	0
ONE channel fail its function	1	0	0
	0	1	0

## "1oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	1	1	1
ONE channel fail its function	1	0	0
	0	1	0

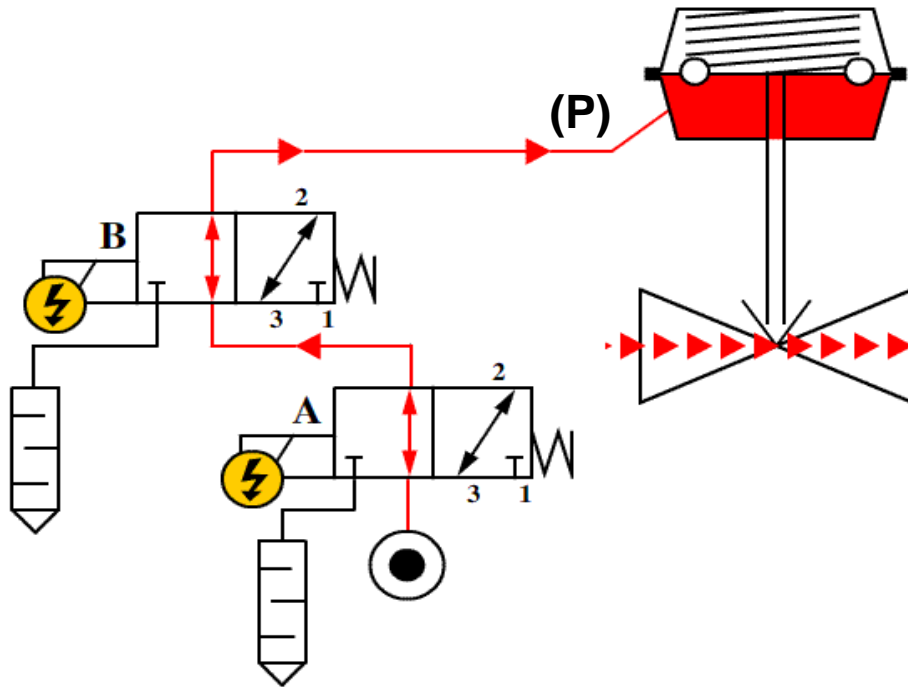
De Energise  
Without  
Error

Error  
Valve  
A

Error  
Valve  
B

# REDUNDANT SYSTEM 'SAFETY'

Double channel: switching on: SERIES / switching off : PARALLEL



'1' out of (oo) '2'

## "1oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	0	0	0
ONE channel fail its function	1	0	0
	0	1	0

De Energise  
Without  
Error

Error  
Valve  
A

Error  
Valve  
B

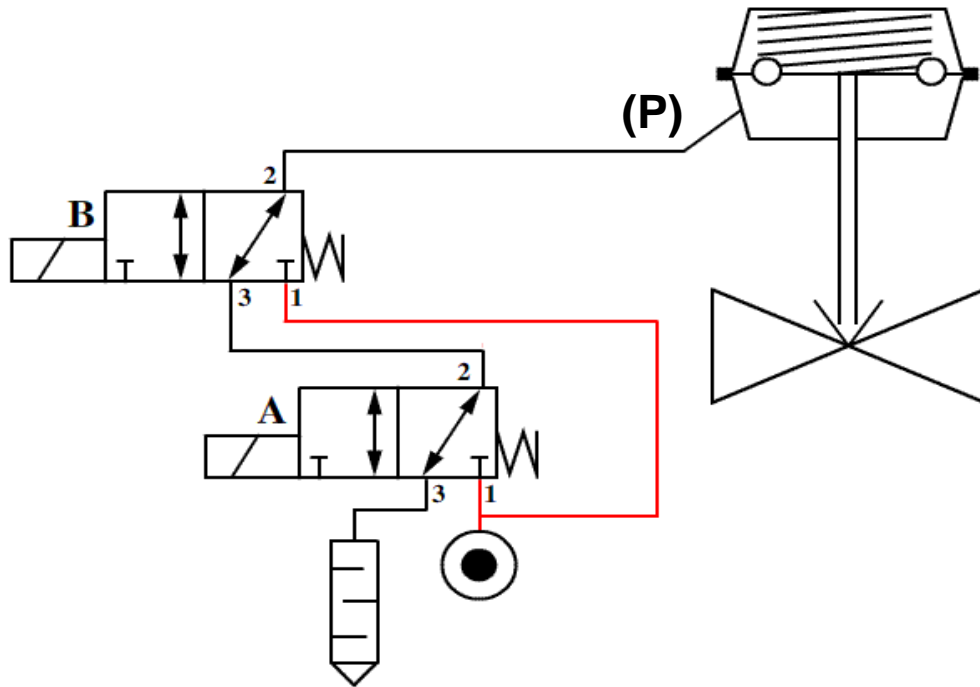
## "1oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	1	1	1
ONE channel fail its function	1	0	0
	0	1	0



# REDUNDANT SYSTEM 'AVAILABLE'

Double channel: switching on: PARALLEL / switching off : SERIES



**'2' out of (oo) '2'**

## "2oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	0	0	0
ONE channel fail its function	1	0	1
	0	1	1

De Energise  
Without  
Error

Error  
Valve  
A

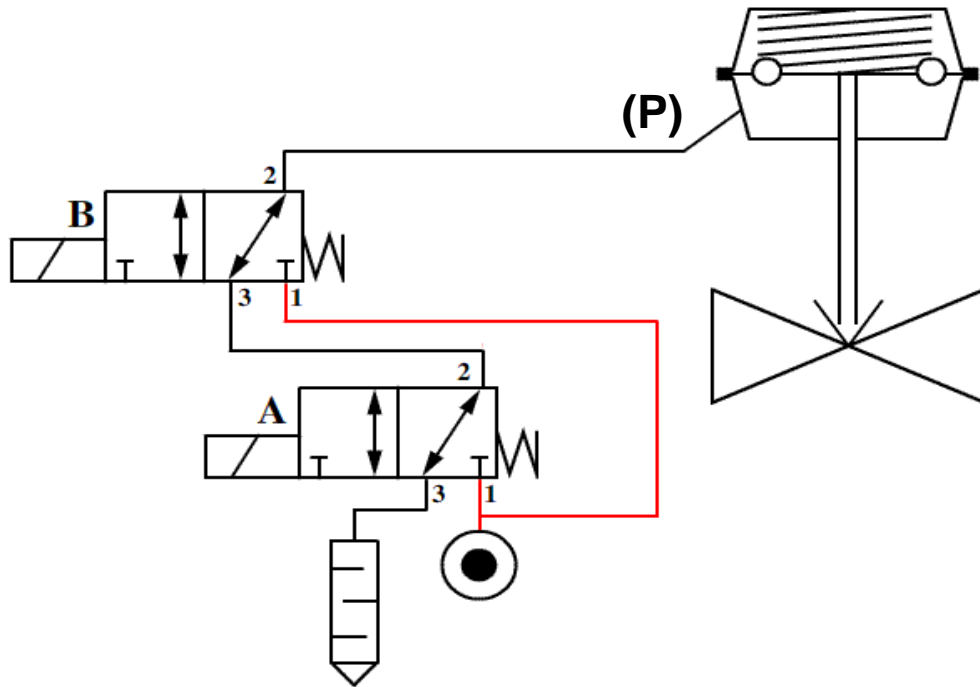
Error  
Valve  
B

## "2oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
All functioning	1	1	1
ONE channel fail its function	1	0	1
	0	1	1

# REDUNDANT SYSTEM 'AVAILABLE'

Double channel: switching on: PARALLEL / switching off : SERIES



**'2' out of (oo) '2'**

## "2oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
<i>All functioning</i>	0	0	0
<i>ONE channel fail its function</i>	1	0	1
	0	1	1

De Energise  
Without  
Error

Error  
Valve  
A

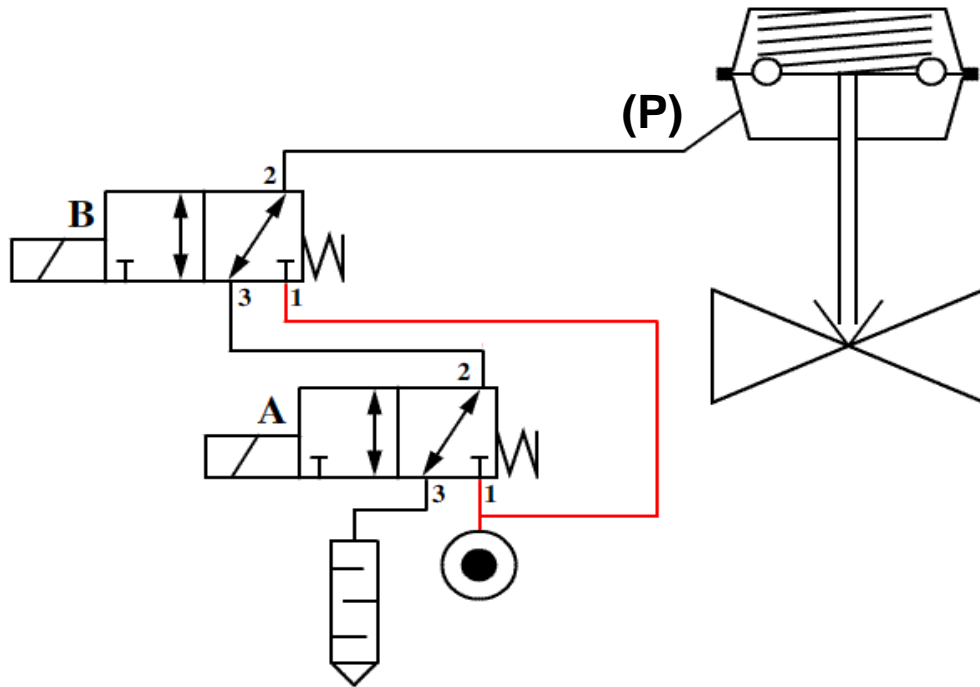
Error  
Valve  
B

## "2oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
<i>All functioning</i>	1	1	1
<i>ONE channel fail its function</i>	1	0	1
	0	1	1

# REDUNDANT SYSTEM 'AVAILABLE'

Double channel: switching on: PARALLEL / switching off: SERIES



**'2' out of (oo) '2'**

## "2oo2" Safety Logic Analysis

Condition	R1	R2	(P)
	A	B	
<i>All functioning</i>	0	0	0
<i>ONE channel fail its function</i>	1	0	1
	0	1	1

De Energise  
Without  
Error

Error  
Valve  
A

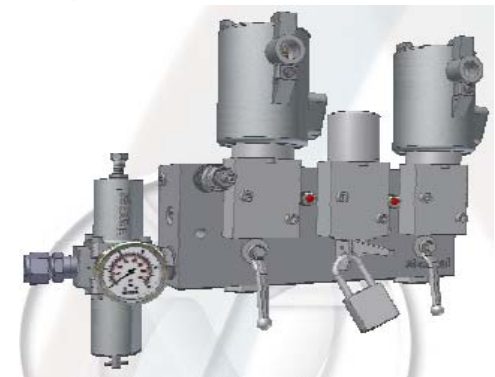
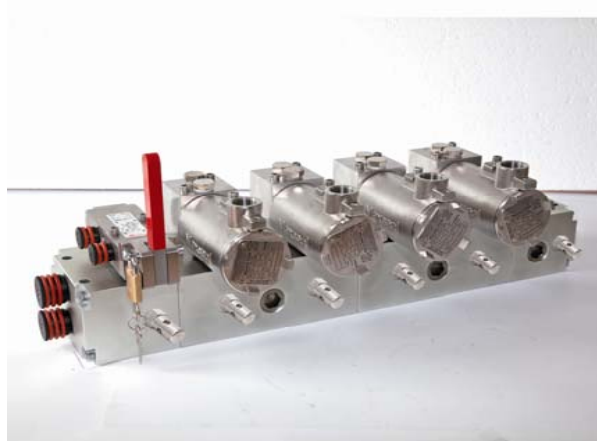
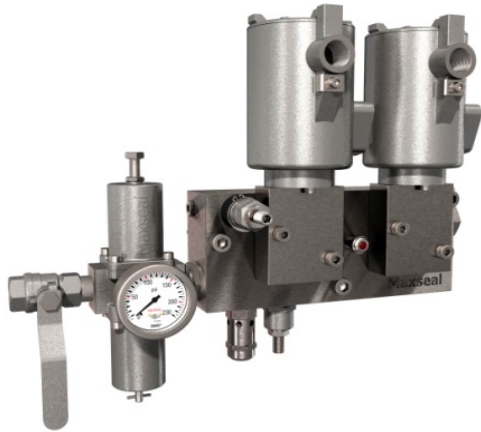
Error  
Valve  
B

## "2oo2" Availability Logic Analysis

Condition	R1	R2	(P)
	A	B	
<i>All functioning</i>	1	1	1
<i>ONE channel fail its function</i>	1	0	1
	0	1	1

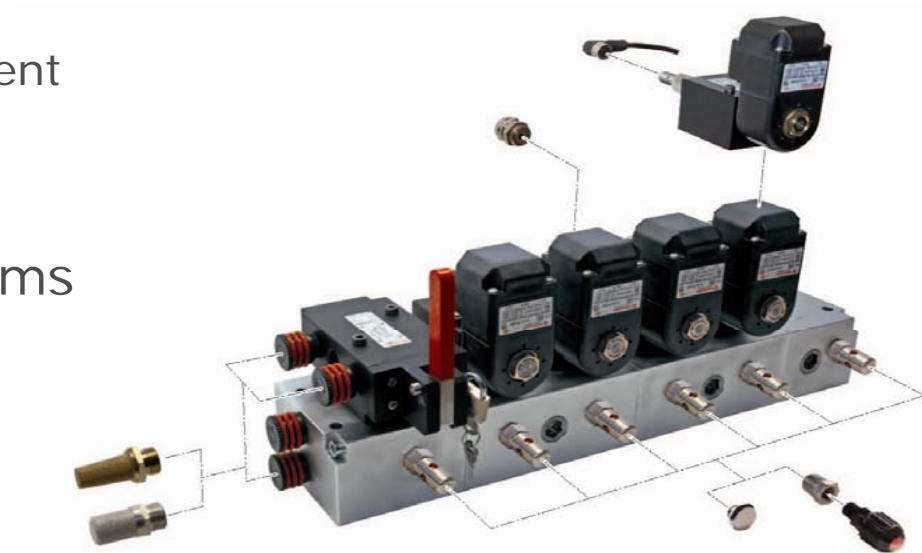


RMV – OPTIONS & SPECIALS



# RVM SYSTEMS – NORGREN SOLUTION

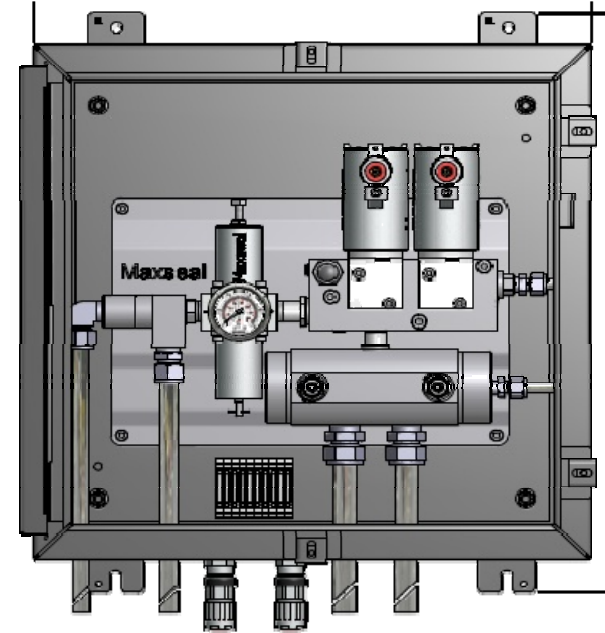
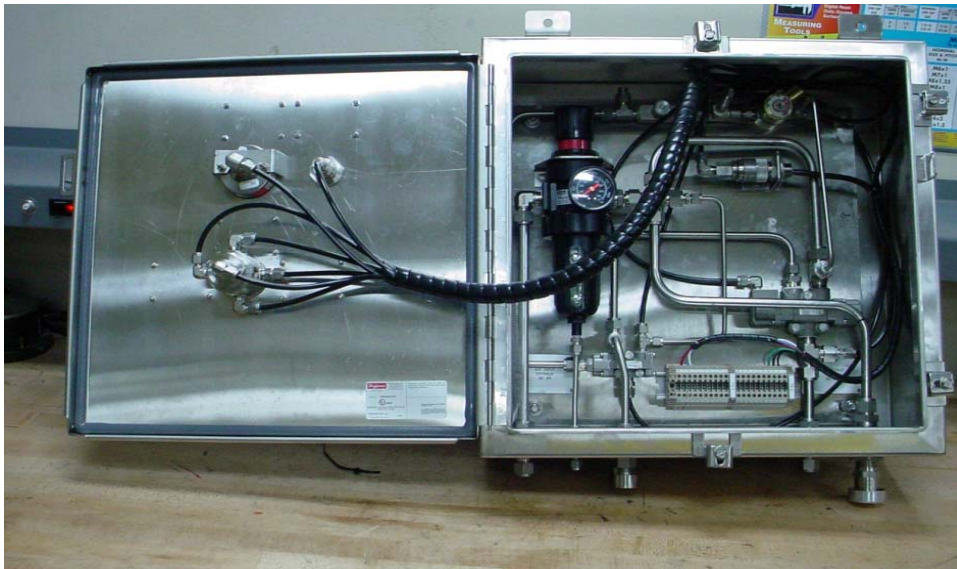
- Compact Modular Design
  - Reduces potential leak paths
  - Simplifies installation and servicing
- Bypass function
  - Enables valve removal online
- Visual Indicators and proximity sensors
  - Clear indication of valve position and output status
- Exhaust guards
  - Prevent particle ingress from the environment
- Cable terminations inside coil
  - No additional Ex terminations required
- SIL and SIRA certified valves and systems
  - Ensure safe reliable operation
- International approvals



# O&G Actuator Control Systems

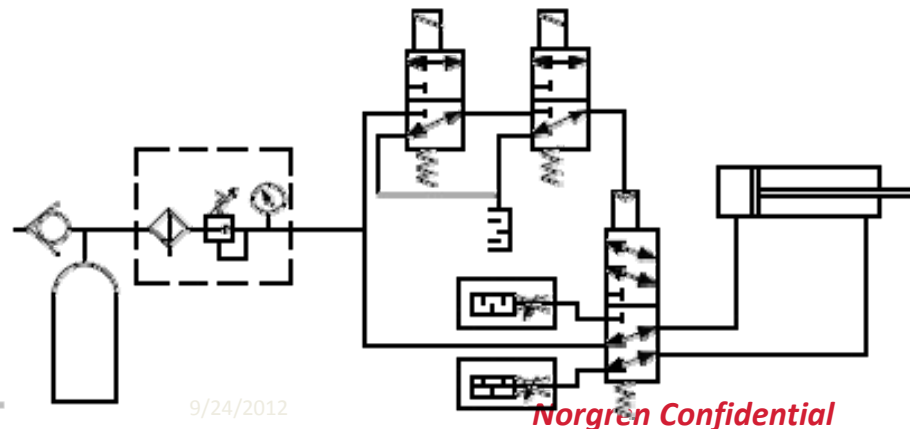
- Double Acting Actuators (EXXON CHAD)

» **ENGINEERING ADVANTAGE**



## 1002 SYSTEM COMPONENTS (INCREASED SAFETY):

- STAINLESS STEEL (IFR)
- DIRECT ACTING VALVES IN 1002 CONFIGURATION
- 5 WAY 2 POSITION VALVE (PILOTED)
- COMPACT MANIFOLD



9/24/2012  
9/24/2012

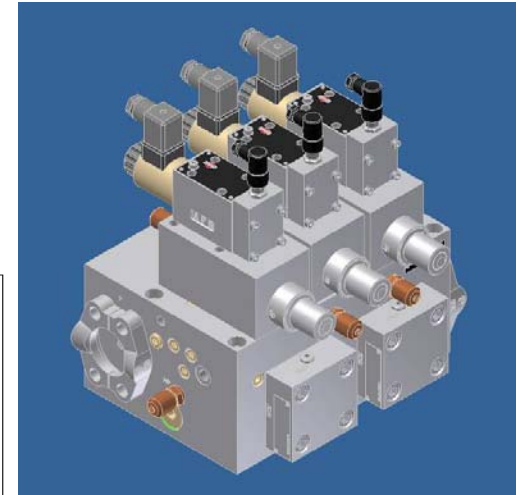
*Norgren Confidential*

17  
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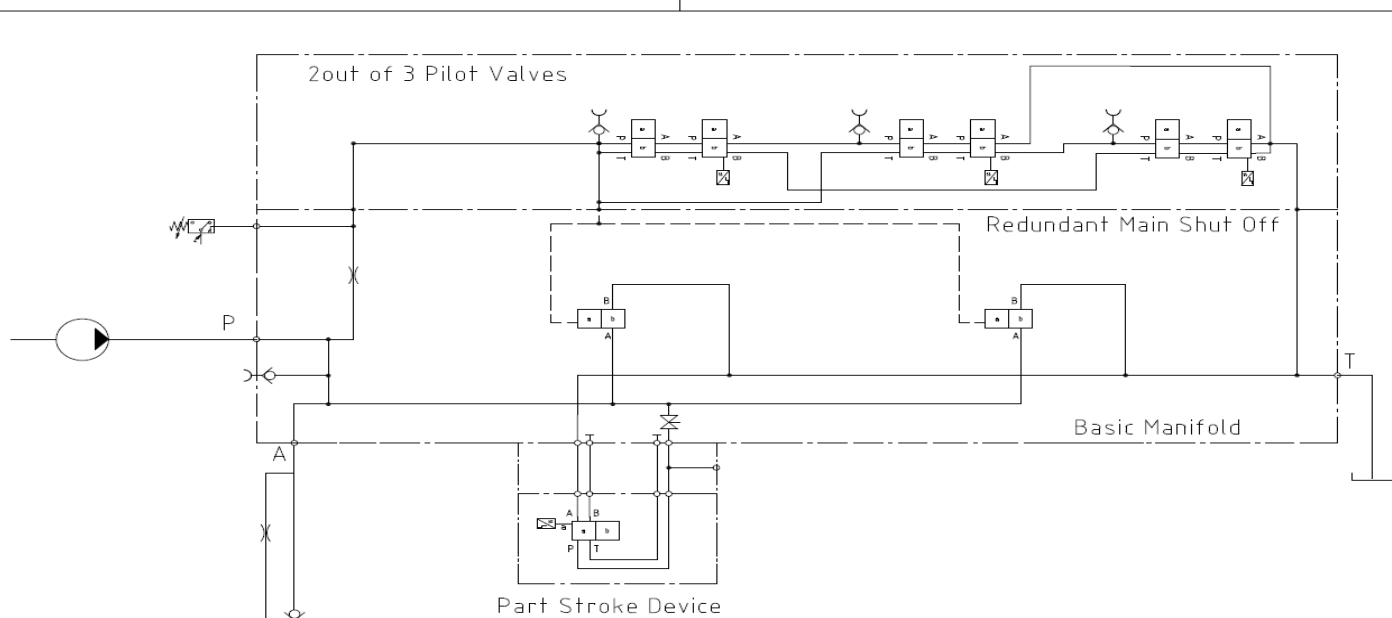
17



# 2003 – Schematic



DIN A3



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General Tolerances/Allgemeine Toleranzen		Rad, Chamfers/Radien, Fasen		Surface Finish		Roughness/ Rauchtiefen		Rz in µm		Rt in µm	
Lim./Gr.	LS/jeanm/Gr.	Rad, Chamfers/Radien, Fasen	Rad, Chamfers/Radien, Fasen	Surface Finish	Surface Finish	Rauchtiefen	Rauchtiefen	~	~	~	~
0.5	h6	±0.1	±0.2	6	±0.2			~	~	~	~
0.1	h6	±0.2	±0.3	6	±0.5			~	~	~	~
0.1	h6	±0.3	±0.4	6	±1			~	~	~	~
0.1	h6	±0.4	±0.5	6	±2			~	~	~	~
0.1	h6	±0.5	±0.8	6	±4			~	~	~	~

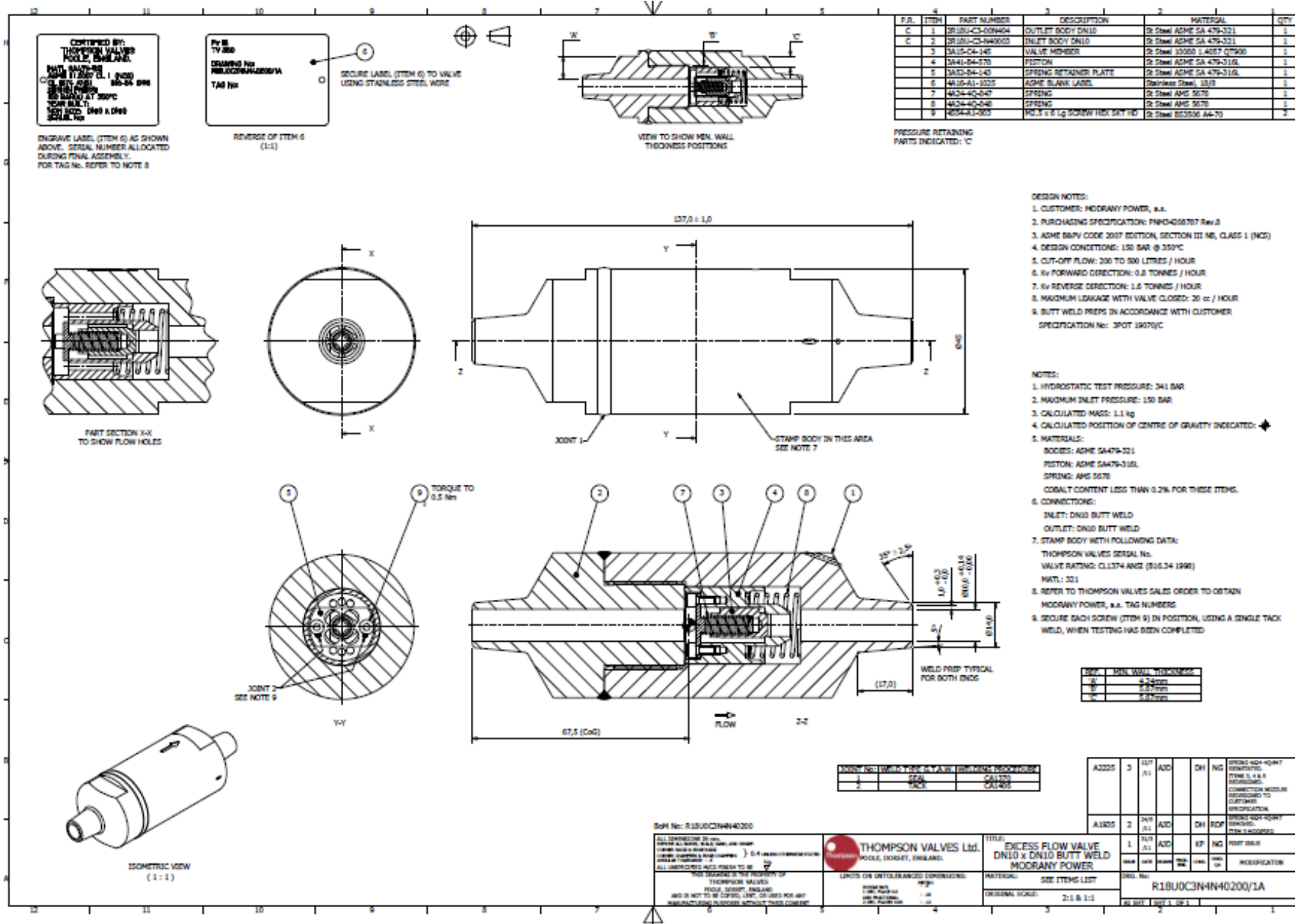
  

Material		Designation/Benennung:	
Ident. No.:		Schema	
Mat. No.:		2 out of 3	
Parts list/		Drawing No./Zeichnungs-Nr.:	
Stückliste		two out of three	
Date/		Page/	
20.01.2012		1	
Name/		Seite/	
Junge		1	
von/		Folien/	
1		1	
Revision		Replacement for/	
ECO-No.		Ersatz für/	
Date/		Filename/	
Name/		2001of3.dwg	
Approved		Scale/	
Freigebe/		1:1	
HERION		F=14.01.1999	
HERION		T=01.10.1999	
Systemtechnik			
GmbH			

## EXCESS FLOW VALVES

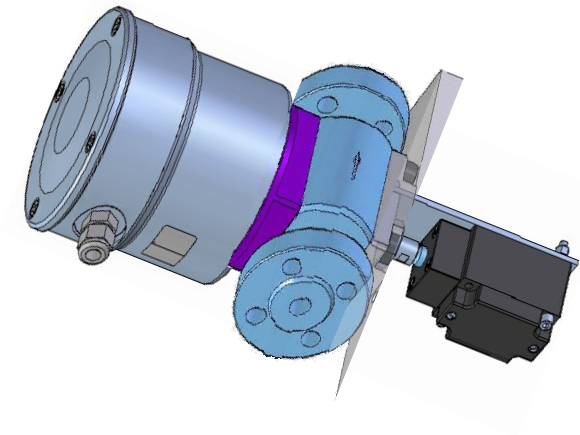
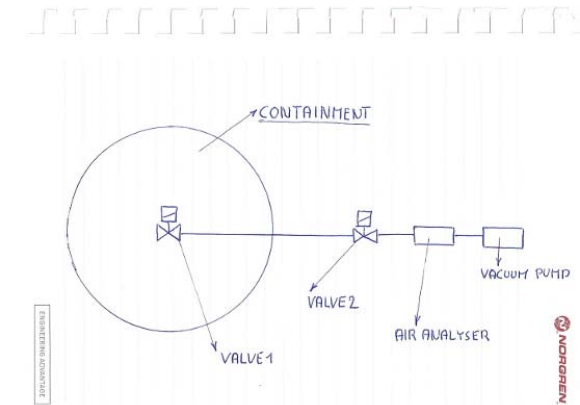
- Size: DN6 to DN250
- Pressure Range – Up to 6000psi / 41 Mpa
- Temperature Range – Up 400°C
- Stainless Steel Construction
- Designed to Customer Specified Flow Rate
- Metal to Metal Seat
- ASME qualified B & PV Code, N stamp



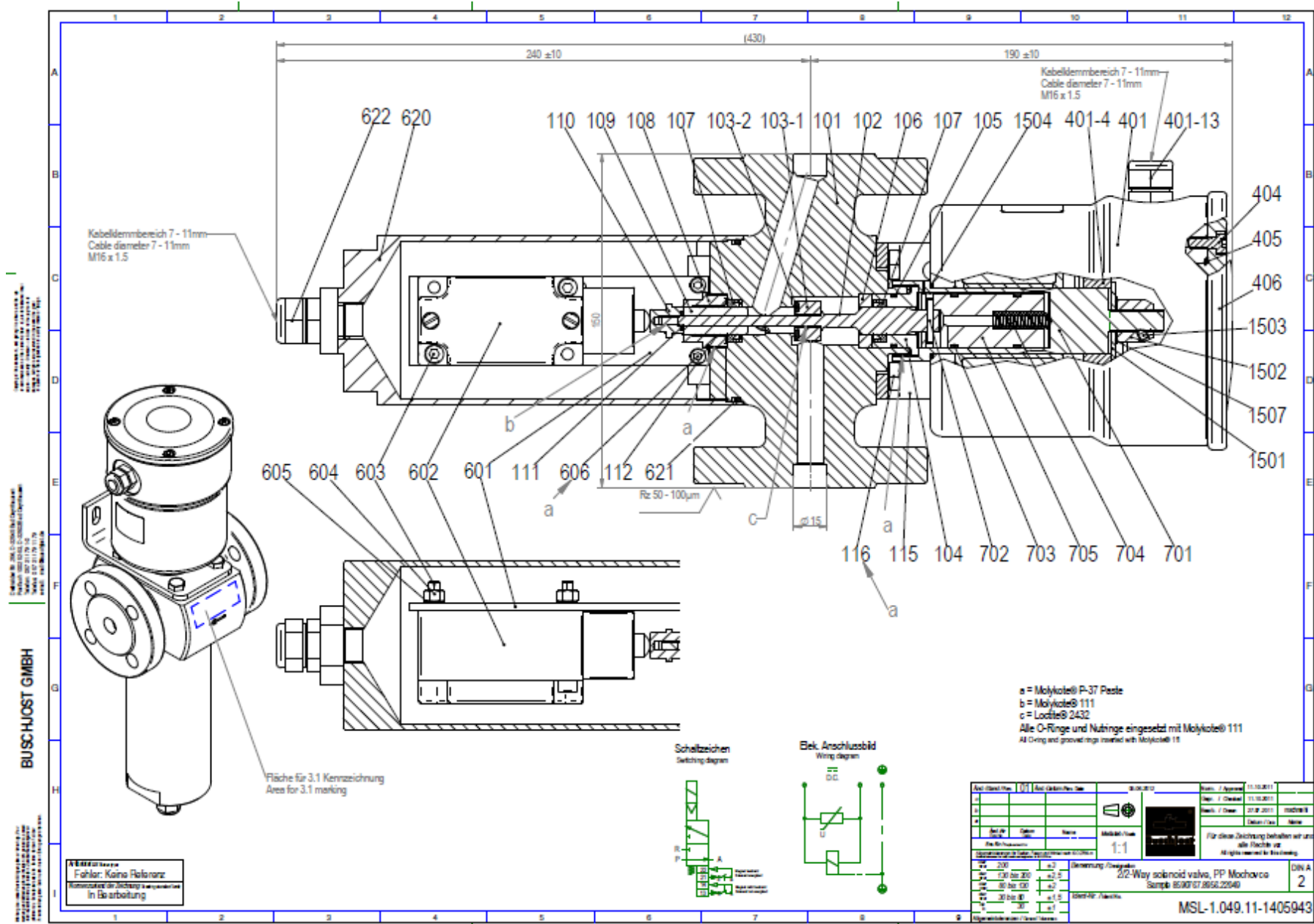


## Nuclear Custom Solution Solenoid Valves

- Customer: VUJE & Technos
- End-user: Enel / SE
- Project Name: NPP Mochovce 3&4
- Application: analyse of radiation inside containment
- Product: Custom Buschjost solenoid valves
  - 1405043.0000.22049
  - 1405944.0000.22049
- EA: Reliability at LOCA event – closed valve
  - Spring force 44 N vs. Friction 3,5 N
  - Design conditions
  - Position indication















## TOP 5 Opportunities for sales in the next 3 years

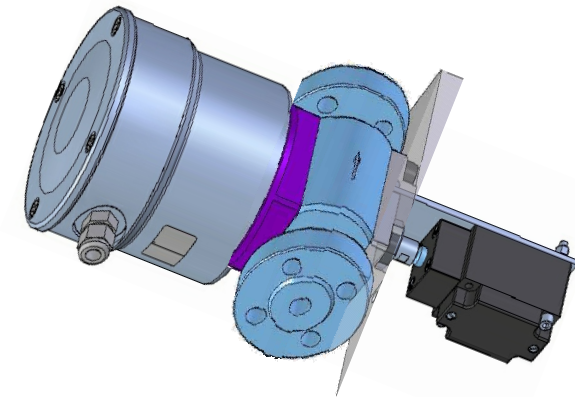
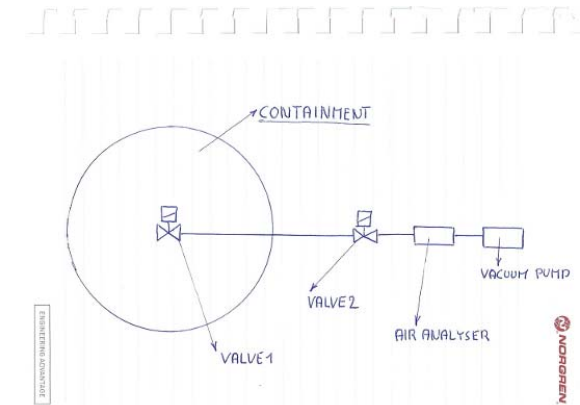
Cover Sheet TOP 5 Opportunities in the next 3 years

Country	Customer Name	Sales Revenue 2012 (K£)	Sales Revenue 2013 (K£)	Sales Revenue 2014 (K£)	Estimated Decision Date	Estimated First Delivery date	Notes
Czech R.	VUJE	44	560	0	April 12	May 13	Buschjost valves,MO3&4
Czech R.	NPP Temelín	0	380	0	August 12	April 13	109 00 057
Hungary	NPP Paks	10	150	150	June 12	October 12	Water analyse of cooling water - sol. Valves, pressure regulator
Hungary	GE Power	70	80	80	November 12	May 13	Control solenoid valves
Russia	Ozna	30	100	150	May 12	June 13	Oil&Gas measurement system

- VUJE: (details in the next slide), there is plan to invoice part of the business 20% K119£
- NPP Temelín: successful technical meeting , pain with existing valves ,core tube break wrong dimensions of core and spring
- NPP Paks: detailed technical specification from EPC (Kopis)
- GE Power: already won
- Ozna: oil&gas measurement system, tested solution, customer pain identified

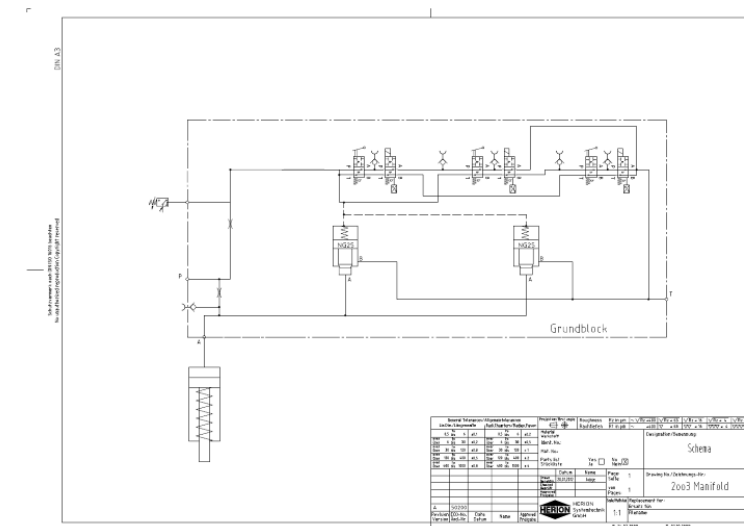
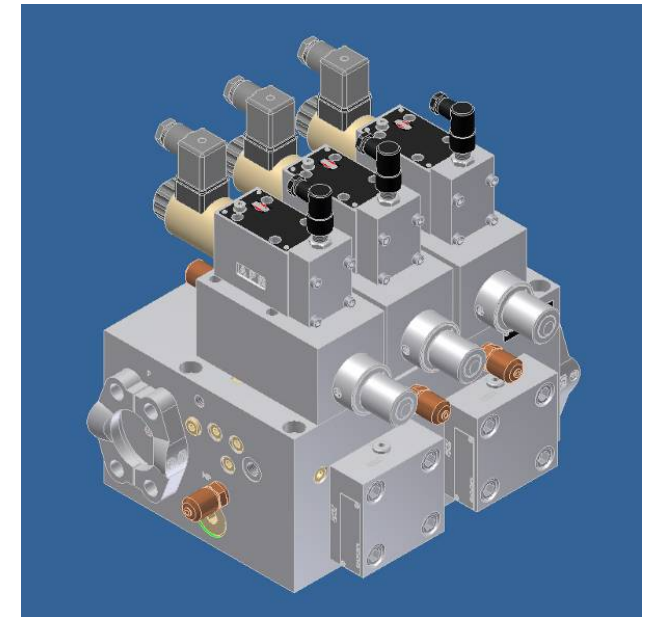
## Key Opportunities Status:

- Customer: VUJE & Technos
- End-user: Enel / SE
- Project Name: NPP Mochovce 3&4
- Application: analyse of radiation inside containment
- Product: Custom Buschjost solenoid valves
  - 1405043.0000.22049
  - 1405944.0000.22049
- EA: Reliability at LOCA event – closed valve
  - Spring force 44 N vs. Friction 3,5 N
  - Design conditions
  - Key Account management knowledge
  - Position indication
- Financial revenue: K 593 £
- GM: 80%
- Status: Ordered samples for qualification 2012 (K 44 £)
- Estimated Delivery Date: May 2013



## New Technology Opportunity:

- Customer: Doosan – Škoda power
- Application: 2oo3 system for control of main steam isolation valve at turbines
- Product: Custom 2oo3 hydraulic manifold
- EA: SIL 3 approved and certified solution
  - Compact system – plug & play
  - Respond time less than 60 ms
  - Repairs available during operation
- Financial revenue: K 100 £
- GM: 75%
- Status: Solution prepared, technical solution introduction this week
- Estimated Delivery Date: January 2013
- Amplification: Siemens Turbine Machinery Czech R.  
+ other



## Opportunities issues and Challenges (potential high opportunity):

- **NPP Paks** – Shut off bellows Valves - Splav valves from Russia are still available at local stock
- **Customer:** Enemona – EPC of I&C technologies  
End-User: Enel / SE
- **Project:** NPP MO3&4 I&C of secondary circuit
- **Products:** Condensation pots (Thompson)
- **Estimated financial revenue:** K 1 000 £
- **Issues:** Do they have budget for this project (previous has been about K 300 £)  
Technical specification – materials, environmental qualification – approvals
- **Advantages:** Our knowledge, local attendance
- **Targets:** Minimize our risks
- **Status:** Final evaluation of budgetary price, If they respond positively, let's continue with with max. policy to reduce our risk



## Won Opportunities in 2012

<b>Cover Sheet WON Opportunities in 2012</b>				
Country	Customer Name	Sales Revenue 2012 (K£)	Sales Revenue 2013 (K£)	Sales Revenue 2014 (K£)
Czech R.	VUJE	44	595	0
Hungary	Hafi	50	60	70
Hungary	GE Power	70	80	80
Hungary	GE Water	40	40	40
Hungary	Emerson	30	30	30
Hungary	NPP Paks	51	0	0
Hungary	Ganzair	23	30	30
Russia	Technoarm	67	60	60
Russia	NPF Control	32	32	32
Russia	Bozna/Irtek	38	0	0
Russia	Promsnab	38	0	0
Poland	Siemens	80	50	50
Ukraine	Kruger	15	20	20

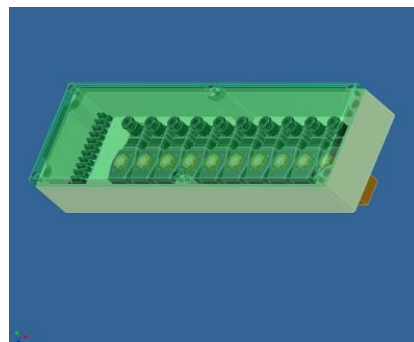
# Opportunities created in 2012



Cover Sheet Opportunities created in 2012						
Country	Customer Name	Sales Revenue 2012 (K£)	Sales Revenue 2013 (K£)	Sales Revenue 2014 (K£)	Estimated Decision Date	Notes
Czech R.	Doosan-Škoda Power	0	130	130	July 12	Hydraulic 2oo3 SIL 3Control systém
Czech R.	Siemens Turbines	0	200	200	October 12	Hydraulic 2oo3 SIL Control systém
Czech R.	VAE	20	0	0	May 12	Control cabinets
Czech R.	ZVVZ Milevsko	59	100	120	May 12	DCS
Czech R.	Škoda JS	0	32	0	May 12	Nuclear check valves
Czech R.	Modranská Power	51	0	0	May 12	Custom solution for excess flow valves
Czech R.	NPP Dukovany	46	0	0	June 12	Herion valves 1090055
Czech R.	SE/Enel	30	0	0	May 12	Herion valves 1090048
Hungary	NPP Paks	0	250	100	January 13	Buschjost valves for radiation analyze
Russia	Kurgankhimash	37	50	50	May 12	Module compresor systém
Russia	Samson	38	38	38	May 12	ICO3 and ICO4
Russia	Tyazpromash	13	30	30	June 12	ICO3 and ICO4
Russia	SRG	102	0	0	June 12	SOV3, SOV5, ICO4
Ukraine	AS Global	98	0	0	August 12	SOV - Gas separators
Ukraine	Emerson	28	50	50	May 12	ICO3

NPP Dukovany – expected PO this week

ZVVZ Milevsko – Value proposition successfully presented, quoted, EDD 5/, Delivery 8/12



## Key Objectives:

- Excess Flow Valves project – K 400 £ - successful delivery 10/ 12
- LDM – MO3&4 project K 100 £– to receive PO at 8/12 and deliver it in11/12
- VUJE – project – K 593 £ keep schedule&process with target to deliver it 5/13
- ABB Poland, Bibromat Poland - K 125 £ to finalize it this year
- Increase of real new opportunities in Poland and Ukraine (New Accounts&Projects)
- Development of conventional energy in Poland
- NPP Paks – successful finalization of hermetizing projects
- NPP Paks – successful development of analyze cooling water project
- Hafi & GE Power
- Evaluate properly the potential opprtunity at ENEMONA
- Finalization of projects – SRG,OZNA, ATEK,Slavneft
- KAM starts in Kazakhstan – development and support