MANUAL AND MAINTENANCE INSTRUCTION

PIG AND LIPS

6” SCH10S



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☐ Seules les pages révisées font l'objet de l'émission de référence. Only the revised pages are sent with the last issue to date.

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1. FOREWORD

1.1 CONFORMITY

You have purchased an ABB France I.A. Cellier Activity product.

This operating manual provides the operator with appropriate instructions for safe and correct operation and to facilitate the maintenance. This manual must have been read and understood by every individual given the task of transporting, installing, commissioning, maintaining operating and repairing the equipment and be available to the operating personal at all times.

2. AFTER-SALES SERVICE

Our after-sales service will provide you with all technical information on ABB France I.A. Cellier Activity products and their applications. Should you have any questions regarding our products, please contact :

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2.1 PRODUCTS HANDLED BY THE EQUIPMENT

The equipment has been designed to handle certain products. Typically these products are :

- Petroleum oils and additives.
- Paints.
- Water.

The transfer of any products other than those defined above can be harmful to users or to the equipment (solvent with a low flash point, overheated products, aggressive/corrosive products etc.…)

In case of doubt, contact ABB France I.A. Cellier Activity.

2.2 PIGGED LINES

The equipment has been designed for ABB pigged lines.

The equipement can be used in other makes of pigged line **but the following items must be carefully checked :**

- The internal diameter of the pigged line,
- The pigged lancher/receiver and pigged valves used on the pigged line,
- The instrumentation of the pigged line,
- The construction method of the pigged line (no penetrating welds and no internal sharp edges),
- The assembly method of the pigged line and the pipe (flange and pipe connections perfctly aligned),
- The piping and equipement supports,
- The pig detection method and equipment.

2.3 GUARANTEE

ABB Cellier assume no liability for damage or malfunctions resulting from failure to comply with the installation, operating or maintenance instructions.

Parts subject to wear are not guaranteed.

Guarantee claims must be made by quoting ABB Cellier order number immediately on detecting the defect and within the scope of warranty obligations mentioned in the purchase contract.

The guarantee does not cover damage resulting directly or indirectly from :

- Inappropriate use.
- Non-compliance with our storage instructions.
- Faulty equipment or facilities connected to the product.
- Vibrations generated by external units (sample : pumps) and transmitted to the product.
- Incorrect cables and wiring.
- Use of non-genuine spare parts and accessories from ABB France I.A. Cellier Activity.
- Modification of our product without prior written approval from ABB France I.A. Cellier Activity.

3. TECHNICAL DATA

These operating instructions concern the following ranges of pig :

- Either monobloc, requiring in this case the complete replacement of the pig (mainly 2”),
- Dismountable, requiring the replacement of only the lips after the dismantling of the pig.

General technical data regarding the pig can be found in the following attached documents :

- Data sheet n° C48003763.

4. MAINTENANCE

In all cases preventive maintenance is necessary with the pig replacement. It will be more difficult to replace a damaged or too worn pig than a normally worn pig. The pig lifetime is specific to each installation. The pig replacement periodicity can be defined after a few months operation by frequently checking during this period (say once every two weeks) the state of wear of the pig lips. The attached sheet can be used to record the findings line by line.

It is also possible to observe signs which indicate that a pig is worn such as :

- Pig detections in launching/receiving stations are not stable during product pumping. ABB Cellier programmed control systems give warnings if this happens during an automatic sequence.
- Pigs can be sucked out of the launching station by the product. ABB Cellier programmed control systems give warnings if this happens during an automatic sequence.
- Demisters become full of product more quickly. This can also be observed by regularly monitoring the levels in the demisters and noting the frequency with which the emptying is necessary.
- Pig sequences take longer. ABB Cellier programmed control systems give warnings if the pigging operation is too long.

5. PIG SIZE

The following table can be used to determine if a worn pig can be re-used or if the pig / lips need to be replaced.

ABB reference / Item code	Nominal pipe size		Nominal internal pipe diameter (mm)	Minimum recommended external lip diameter (mm)
4JFR000001A0027	**6"**	**SCH10S**	161,5	163

6. PIG DAMAGE

A normally worn pig lip will show even signs of wear on the whole circumference and the tip of the lip will be point and not flat as for a brand new pig lip. However if the lips is cut, split or has lumps missing then this is a sign that something is wrong with the build of the line (if the pigs are always in this condition when changed) or that an incident has happened during the pig operation which has led to the lips being damaged.

7. PIG STORAGE

The mechanical characteristics of pig material (lips and bodies) can be adversely affected if stored for a long time (more than 6 months) in humid conditions

Storage under the following conditions will help to eliminate such effects and the resulting reduction in their working life :

- Stored in sealed, opaque bags, anti UV with humidity absorber.
- Labelled with the delivery date.
- Temperature between 15°C and 35°C.
- Out of direct light.
- Inside.

8. AIR PRESSURES

The air pressure used for pigging can sometimes be the cause of damage if it is set too high. The pressure is set using a manual pressure regulator on the air supply line to each launching and receiving station. It can be necessary to increase the pressure in case a pig becomes blocked but the pressure must always be reduced to a suitable operating pressure. The actual required pressure depends greatly on the line configuration and the products pigged. If the pressure is set too high then the pigs will travel very fast in an empty line condition (pig positioning or at the end of transfers for example). A high pressure will also increase the compressed air consumption and increase may result in increased cycle times as the decompression time will be longer.
Normal operating pressures are between 2 to 4 bars.

9. TYPICAL PROBLEMS WITH THE BUILD OF A PIGGED LINE

9.1 INTERNAL WELDS NOT SMOOTHED

After welding a flange onto the pipe it is necessary to grind the internal weld bead to a smooth finish at the same internal diameter as the pipe. This will prevent pig lip damage as the pig passes over the weld. This cause is usually found immediately after construction during the commissioning phase and is not a cause of sudden damage after a period of satisfactory operation.

9.2 PIPE JOINING

Pipe joining is done using the sleeve junction method with no penetration welding, to ensure that the pipe junction will not cause damage to the pigs. If the internal edges of the pipes at the cut end are not de-burred and rounded off then the pig lips will be damaged. If the pipes are not spot welded face to face but with a gap then this could also cause the pig lips to be damaged. If the internal pipe diameter tolerances are not tight enough then two adjacent lengths of pipe could have different internal diameters meaning that a smooth transition from one pipe to another is not possible and consequently the lips will be damaged. This cause is usually found immediately after construction during the commissioning phase and is not a cause of sudden damage after a period of satisfactory operation.

9.3 ROUGH INTERNAL PIPE FINISH

Not all pipe specifications require the same smooth internal finish as used for pigged lines. The use of such pipes could lead to abnormally fast wearing out of pig lips. The same is true if the pipes have been poorly protected during the storage/construction phase. The pipes delivered must come with protective end caps and are internally oiled before packing. They should be kept in this condition up until the moment they are required for construction and as far as possible stored in a covered/protected area.

9.4 FLANGES NOT PROPERLY LINED UP

When making flanged connections on a pigged line two (2” & 3” lines) or four (4” & 6” lines) centering pins are installed. These pins ensure that the flange bores are lined up so that the pig passage is smooth and it does not come up against a shoulder. Flange connections are used when installing pig stations or valves in a pigged line. Depending on the installation method the centering pins could have been removed and replaced by normal bolts. If this is the case then it is necessary to make sure that M16 bolts have been used for 2”, 3” & 4” lines and M20 bolts have been used for 6” lines, to check the flange to flange line up and to check that the bolts are tight. Periodic flange tightness checks should be performed (every two to three months).

9.5 PIPE SUPPORTS

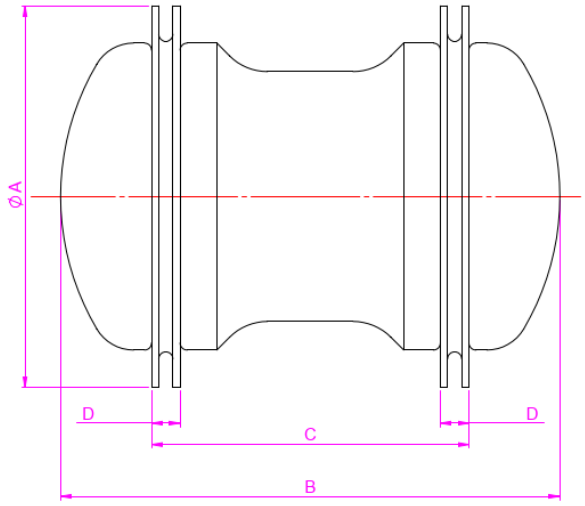
Due to the pigging process and the vibrations caused by the movement of pigs, especially through the bends, it is important that the pipe supports are frequent enough and correctly installed. If this is not the case then the shocks resulting from pig movement and loose pipes could cause the flange connections to come loose and, in extreme circumstances, the pipes to be damaged. A damaged pipe, with a dent for example could cause the pig lip to be damaged. Periodic support fixing checks should be performed (every two to three months).

10. REFERENCE DOCUMENTS

- C48003763 : Datasheet Pig
- Pig Inspection Sheet.

11. DATASHEET PIG

NPS	ND / *DN*	PIPE / *TUBE*	SCH	ØA	B	C	D	Weight / *Poids* Kg
2"	50	STEEL / ACIER	10	57	74	51	5	0,180
2"	50	STEEL / ACIER	40	55	74	51	5	0,180
2"	50	S.S. / INOX	10	57	74	51	5	0,180
3"	80	STEEL / ACIER	10	87	105	69	7	0,600
3"	80	STEEL / ACIER	40	82	105	69	7	0,600
3"	80	S.S. / INOX	10	87	105	69	7	0,600
4"	100	STEEL / ACIER	10	112	140	90	8	1,200
4"	100	STEEL / ACIER	40	107	140	90	8	1,200
4"	100	S.S. / INOX	10	113	140	90	8	1,200
5"	125	STEEL / ACIER	10	137	200	115	12	3,000
5"	125	STEEL / ACIER	40	133	200	115	12	3,000
5"	125	S.S. / INOX	10	140	200	115	12	3,000
6"	150	STEEL / ACIER	10	165	210	126	12	4,140
6"	150	STEEL / ACIER	40	160	210	126	12	4,140
6"	150	S.S. / INOX	10	167,5	210	126	12	4,140





REV	DATE	STATUS FOR	DESIGNATION	DRAWN BY:	CHECKED BY	APPROVED BY:	CUSTOMER APPROVED BY
B	15/04/10		UPDATED / MISE A JOUR	R.DEPLANTE	Th. DELECLUSE	C.PIERCE	
A	28/01/08	PROJET	Première Emission	TOURNIER	PIERCE	T.DELECLUSE	

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CUSTOMER :
PLANT :

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DATA SHEET PIG / RACLEUR

SCALE	SIZE	CUSTOMER N° Plan / Drawing Number	ABB France N° Plan / Drawing Number	REV.
	A3		C48003763	B

12. PIG INSPECTION SHEET

Pig Line Diameter : .....
Pig Line Reference : .....
Pig Line Length : ……

	Inspection date	Inspection date	Inspection date	Inspection date .....
Reason for pig inspection				
Time since last inspection or since new				
Number of cycles performed and/or distance covered				
External pig lip diameter				
Condition of pig lips				
Condition of pigs ends				
Pig ends correctly screwed and not loose				
Condition of centre body				
Other remarks				
Decision : - Re-use as is : - Replace damaged parts : - Destruction :				

Date : ..... Signature : .....